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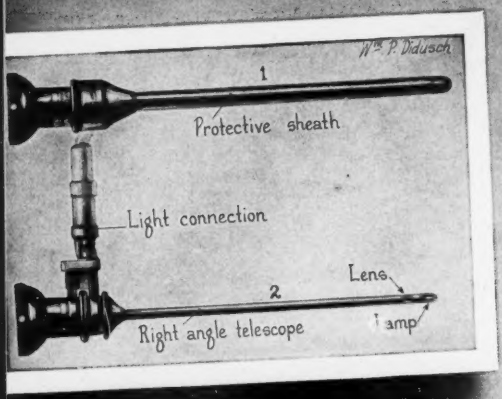

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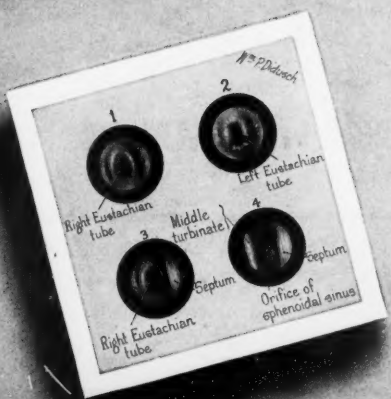

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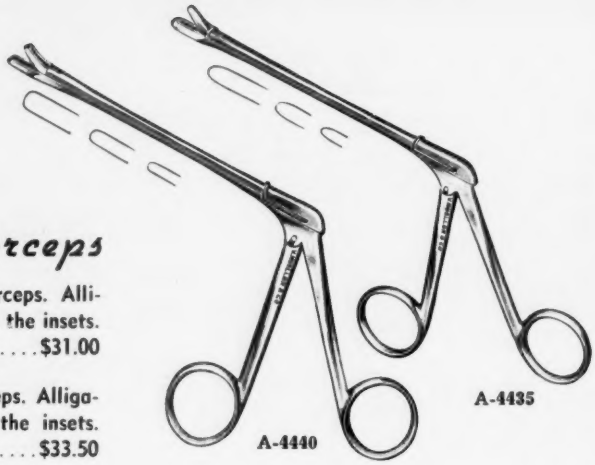

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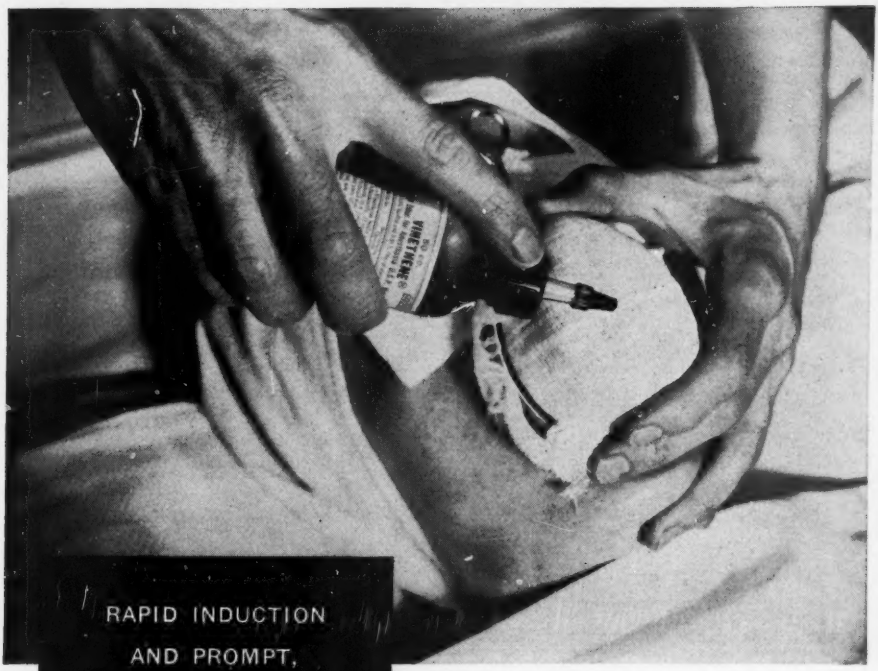

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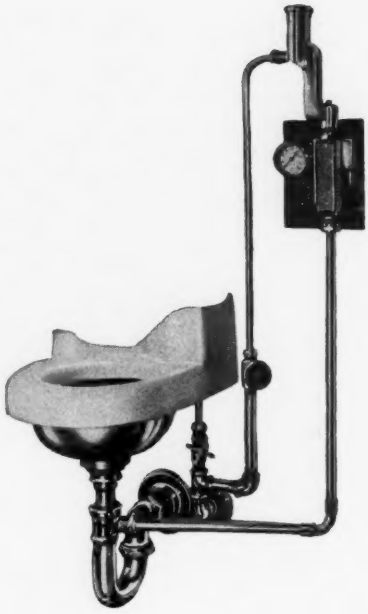

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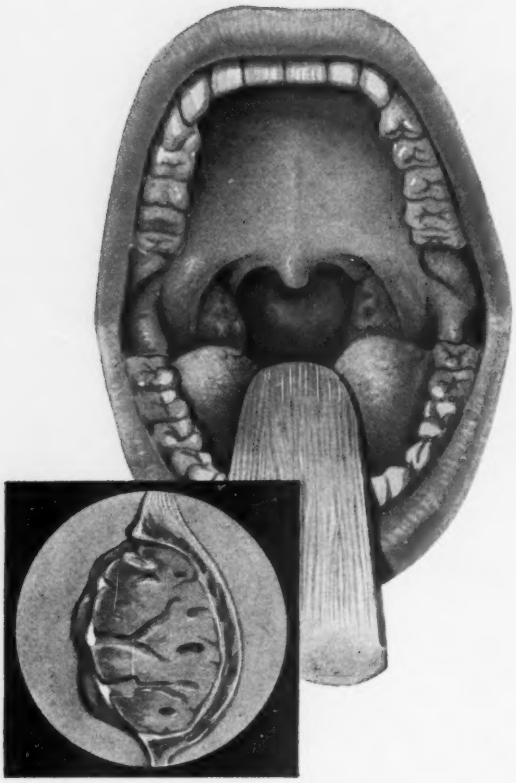

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ARCHIVES OF OTOLARYNGOLOGY

VOLUME 54 NOVEMBER 1951 NUMBER 5

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MANAGEMENT OF DEFORMITIES OF THE LOWER CARTILAGINOUS VAULT

SAMUEL FOMON, M.D.
IRVING B. GOLDMAN, M.D.
HARRY NEIVERT, M.D.
AND
ALFRED SCHATTNER, M.D.
NEW YORK

THE PRESENT corrective procedures for deformities of the lower cartilaginous vault are based upon a reduction of the cartilage mass. For instance, to narrow a wide tip, sections are removed from the angles; to reduce bulbousness, the cephalic margins of the lateral crura are trimmed, and to lessen undue projection, cartilage is resected from the mesial and/or lateral crura (Fig. 1). The chief objection to the procedure is that healing of the deskeletonized lobule is not always predictable, and because of this there frequently results a pinched "surgical" look in a lobule well modeled at the end of the operation. Despite this objection, the method is expedient when the deformity is due to an excess of cartilage. But when the bulk of the cartilage is within normal limits and the deformity caused merely by an abnormal shape, better results can be assured by altering the shape of the cartilage than by sacrificing its substance. The benefits of the procedure are that it assures a more orderly healing and prevents the possibility of an artificial postoperative look.

A cursory review of the anatomy and a few dissections will show that the cartilage in the lobule constitutes but a small part of the lobular mass (Fig. 2). Clinically, in the majority of cases the deformity is due to faults in shape rather than to an overabundance of cartilage. For these deformities we use the following technique. Perhaps the details can best be understood from the following description of the modeling of a misshapen lobule.

Assuming that the soft structures over the bony and upper cartilaginous vault have been elevated in the usual manner, circumferential incisions are made along the lower margin of the lower lateral cartilages, the overlying soft tissues are separated, the cartilages exposed, and the angles cut through (Fig. 3). Satisfactory results will depend as much upon the sequence of the operative steps as upon the care with which each step is carried out. The reconstruction begins with the base of the lobule.

If the columella is wide, enough subcutaneous tissue at the base of the columella is removed to secure the desired narrowing, and a mattress suture of nonabsorbable surgical suture is passed through to hold the raw parts in apposition (Fig. 4*A*). If the base is too wide and/or the septolabial angle depressed and/or the columella too short, the alae are cut through where they abut the lip, and through these incisions the base of the nose is separated from its attachment to the bone. An absorbable surgical suture threaded through two straight needles is then passed through the tissues, entered through one incision and brought out through the other (Fig. 4*B*). The suture

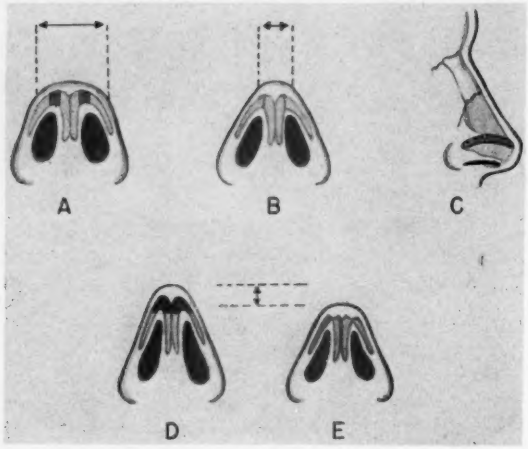

Fig. 1.—Correction of lower cartilaginous deformities by excision of cartilage. Arrow between dotted lines indicates amount of reduction. *A*, sections removed from angles to reduce width; *B*, narrowing as a result of excision; *C*, cephalic margin of lateral crus trimmed to reduce bulbousness; *D*, sections removed from mesial and lateral crura to reduce projection; *E*, reduction in projection as a result of excision.

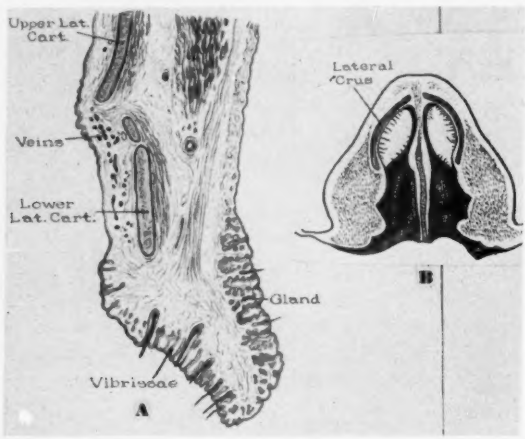

Fig. 2.—Sectional view showing relative size of cartilage as compared with total bulk of lobule. *A*, coronal section through ala; *B*, cross section.

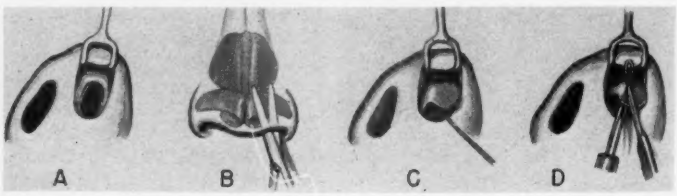

Fig. 3.—Exposure of lower lateral cartilage. *A*, marginal incision along caudal border; *B*, overlying soft structures elevated; *C*, cartilage exposed; *D*, angle cut through on Neivert's hook.

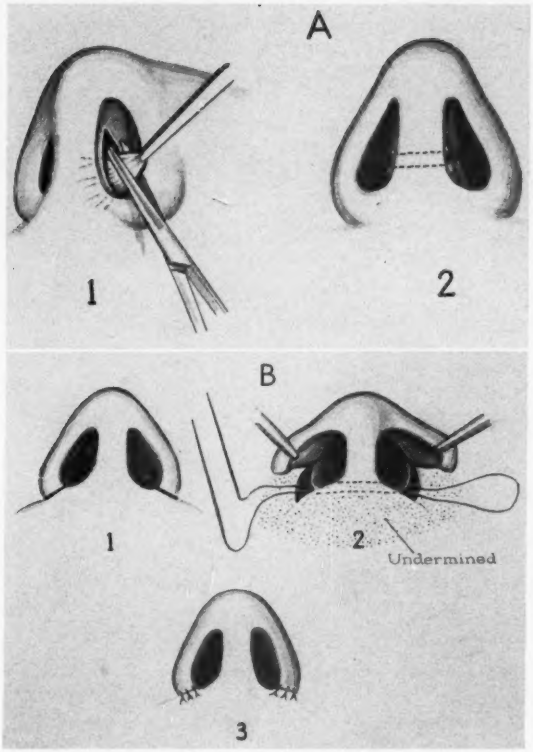

Fig. 4.—*A*, reduction of columellar width: *1*, excess subcutaneous tissue removed; *2*, columellar walls approximated. *B*, narrowing of base: *1*, alae separated from lip; *2*, base of nose separated from underlying bone. Dotted area indicates amount of undermining. Absorbable surgical suture threaded through two straight needles is passed through tissue, entered and brought out through incisions; *3*, incisions closed following tying of suture. (Details are given in text.)

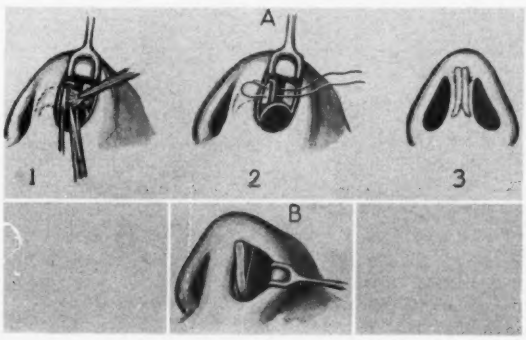

Fig. 5.—*A*, modeling of mesial crura: *1*, both mesial crura exposed through the left nostril and intervening soft tissue removed; *2*, crura approximated by through and through mattress suture; *3*, suture tied. *B*, septal mucosa deepithelized to prevent drooping of tip.

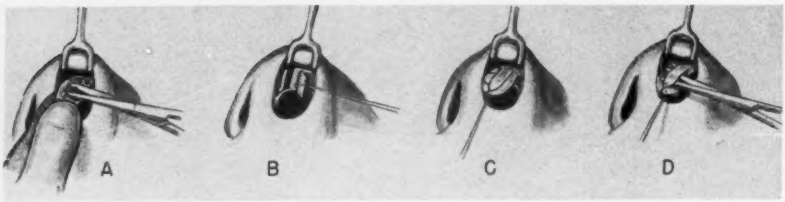

Fig. 6.—Modeling of lateral crus. *A*, soft tissue over cartilage removed; *B*, flap of vestibular skin raised; *C*, cross cuts made through cartilage to break spring; *D*, section of cartilage peeled off when deformity comprises faults in shape and excess bulk.

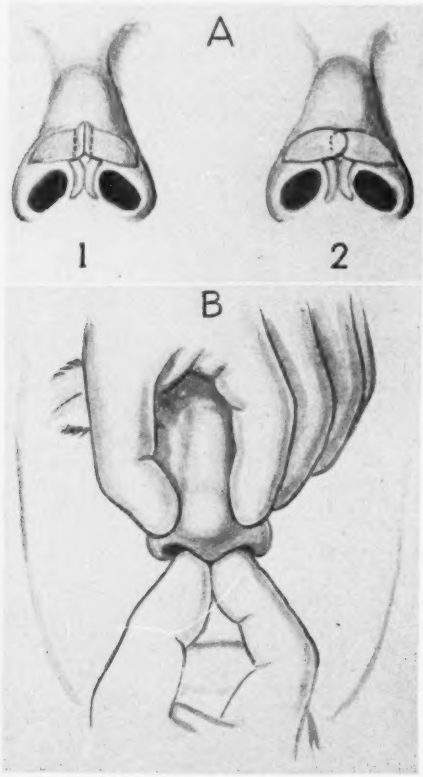

Fig. 7.—*A*, lateral crura placed over mesial crura: *1*, in abutment and *2*, overlapping. *B*, adjustment of soft tissue. Covering flap of skin and subcutaneous tissue and lining flap of vestibular skin and cartilage manipulated into desired relationship.

is tightened to secure the required narrowing. The two incisions are then closed with two or three atraumatic sutures. The septolabial angle is fixed on the septum in either a forward or a backward position, as indicated. It may be necessary to excise a part of the nasal spine to accomplish the latter purpose.

After the reconstruction of the base the mesial crura are exposed, the intervening connective tissue is removed, and the crura are approximated by a through and through absorbable surgical suture (Fig. 5*A*). To prevent subsequent drooping of the tip, the mucosa on the septum is deepithelized and the mesial crura are attached to the septum with a nonabsorbable surgical suture (Fig. 5*B*). The lateral crura are then exposed, and the soft tissue over the cartilage is removed (Fig. 6*A*). A small flap is raised from the terminal end of the cartilage, its size

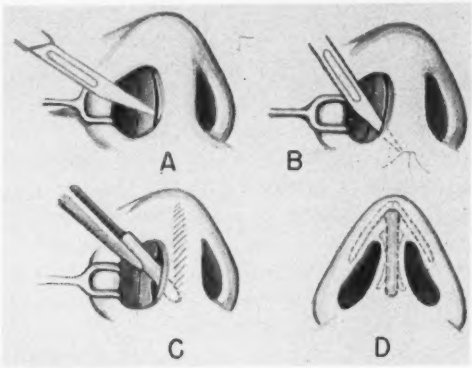

Fig. 8.—Introduction of columellar strut. *A*, incision along mesial crus extended; *B*, pocket made between skin and caudal margin of mesial crura; *C*, strut introduced; *D*, relationship of strut to lateral crura. (Details are given in text.)

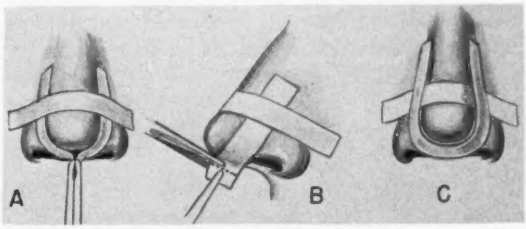

Fig. 9.—*A*, strip of adhesive plaster made to encircle base of lobule, another strip applied over dorsum just above strut, and plaster pinched up beneath lobule to force strut into proper position; *B*, pinched-up tuck excised; *C*, adhesive plaster reinforced by additional strip.

depending on how much of the crura will overlap (Fig. 6*B*). This prevents the burying of epithelium. Furthermore, the small flap provides a cover for the raw area at the apex of the vestibule. The balance of the cartilage is cross hatched until the spring has completely disappeared, the cuts being made in the line of the deformity (Fig. 6*C*). The caudal margin is left intact.

If the fault lies not only in the shape but also in the bulk, the excess cartilage is removed as follows: With a No. 15 Bard-Parker knife parallel incisions are made at strategic points through the cartilage down to but not including the vestibular skin. With the blades of pointed scissors the cartilage is peeled off (Fig. 6*D*). This usually destroys the spring of the cartilage, but occasionally to accomplish this purpose additional cross hatching of the remaining cartilage is required. The terminal ends of the cartilage are then grasped with forceps and placed over

the mesial crura, the two ends being made to abut or overlap each other (Fig. 7*A*). The covering flap composed of skin and subcutaneous tissue and the lining flap of vestibular skin and cartilage are readjusted into the desired relationship by manipulation (Fig. 7*B*).

The incision along the caudal edge of the mesial crus on the right side is extended downward, and a pocket is made between the skin and the cartilage. Into this pocket is placed a strut consisting of part of the removed hump or septal cartilage (Fig. 8). The strut is placed in such a manner as to force the terminal ends of the lateral crura upward sufficiently to attain the proper "break" between the tip and the dorsum. Finally, the alae are inspected and if too convex appropriate wedges are removed from the alar-facial junction. The nasal flaps and columellar strut are held in place with packing.

The nose is painted with benzoin tincture; a strip of adhesive plaster is placed around the base of the lobule and a second piece just behind the strut (Fig. 9). The adhesive plaster is pinched up with a hemostat to force the strut into a more desirable position. The pinched-up tuck is cut away and the plaster reinforced with another strip. A pear-shaped piece of adhesive plaster is then placed over the nose, the base lying along the "break" between the dorsum and the tip. This is reinforced with other strips. Finally, a Stent dressing is applied and left on for a week or preferably longer.

COMMENT

When shortening of the nose is required, the lower cartilaginous vault is rotated over the upper lateral cartilages on the septolabial fulcrum. If the overlapping of the cartilages results in a thickening, it is reduced by a submucous resection of the upper lateral cartilages. The columella is applied to the septum, and the excess cartilage is gauged and excised with a No. 11 Bard-Parker knife. With this procedure there is less likelihood of a postoperative "drooping" of the tip, because large raw surfaces are brought into apposition.

SUMMARY

A method for modeling the lobule, based on a new concept, is described. Since there is a minimal sacrifice of skeletal tissue, the healing process is more orderly and predictable and the hazard of the pinched "surgical" appearance is eliminated. We have given the method sufficient trial to demonstrate that in our hands it produces results superior to those of other methods.

307 Second Ave. (3).

121 E. 60th St. (22).

555 Park Ave. (21).

115 E. 61st St. (21).

NEW METHOD OF PLUGGING THE EUSTACHIAN TUBE IN RADICAL MASTOIDECTOMY USING A POLYETHYLENE PROSTHESIS

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THE FORMATION of a fistula lined with granulation tissue leading to the Eustachian tube after an otherwise nicely healed radical mastoidectomy with constant or intermittent discharge, according to the pathological condition of the nasopharynx, which only poorly responds to conservative measures is well known to every otologist. The idea of plugging the Eustachian tube in order to avoid this complication is an old one, and bone or muscle tissue have been used as plugging material.

With the present widespread experience with the nonirritating qualities of polyethylene deposited elsewhere in the organism, it was only natural to try this material for closing the Eustachian tube. In the Ear, Nose, and Throat Department of the Frederiksborg County Hospital (chief surgeon, K. Kettel, M.D.) I have been given the opportunity to try out the latter method in a series of radical mastoidectomies, the number of patients now totaling 30. Since February, 1950, this procedure has become an additional feature to the usual technique of radical mastoidectomy at the hospital, which follows the principles set forth by Lempert [1] and House.[2]

Great stress has thus been laid on the complete removal of all diseased tissue from the middle ear, including curettage of the mucosa of the Eustachian tube. In addition, the wall of the semicanal of the tensor tympani muscle is broken down with a Frenckner curette and the infected contents of the semicanal removed, thereby establishing a clean, cone-shaped hole at the place of the former canalis musculotubarius. A conical polyethylene prosthesis [3] with a blunt point (7 mm. long, 4 mm. wide at the base) is then inserted. This will fit tightly, and the base will be at a level with the foremost borders of the middle ear. Skin-grafting is done by the method of Thiersch, care being taken to cover the innermost part of the external auditory canal and the anterior part of the middle ear. Penicillin is given

From the Frederiksborg County Hospital.

1. Lempert, J.: Lempert Endaural Subcortical Mastoidotympanectomy for the Cure of Chronic Persistent Suppurative Otitis Media, Arch. Otolaryng. **49**:20 (Jan.) 1949.

2. House, H. P.: Surgery of the Chronically Discharging Ear, Arch. Otolaryng. **49**:135 (Feb.) 1949.

3. The prostheses may be obtained at The Experimental Laboratory of "Ferrosan," Blegdamsvej 72, Copenhagen, Denmark.

routinely until the packing is removed six days after operation. By following this procedure, a fully epitheliated, dry cavity has been obtained in all cases usually within five to six weeks.

Encouraged by this success, revision of chronic discharge after radical mastoidectomy has been taken up at the hospital in another series of 12 patients with equally good results, the operation being usually a simple and quick one.

With the present experience I do not hesitate to recommend plugging of the Eustachian tube with a polyethylene prosthesis as a safe method. The prostheses are kept in dehydrated alcohol for sterility.

PATHOLOGY OF BELL'S PALSY

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NORRKÖPING, SWEDEN

BALLANCE and Duel in 1932 [1] published their famous paper on the surgery of the facial nerve; in cases of Bell's palsy which did not disappear spontaneously they advocated a decompression of the facial nerve from the stylomastoid foramen to the lateral semicircular canal, a modus operandi which today is generally accepted when it is performed on the right indications.

As described by Kettel,[2] and recently also by Hilger [3] and Sullivan,[4] Bell's palsy is in all probability a pathogenic entity, the primary and central feature of which is a "dysregulation" of the circulation which probably takes place near the stylomastoid foramen causing an ischemic paralysis. The consequence of the lack of blood supply to the nerve is edema with subsequent degenerative changes; the nerve is thus compressed in its bony canal, which causes further impairment of the vascular blood supply, so that a vicious circle arises, the process being reversible (Kettel). Surgeons having experience with the facial nerve (Ballance and Duel,[1] Cawthorne,[5] Kettel,[2] and Sullivan [4]) agree that on decompression definite alterations of the nerve near the stylomastoid foramen are noted, the nerve sheath being constricted near the stylomastoid foramen and the nerve proximate to this place edematous.

In a comprehensive paper Kettel describes 50 consecutive cases in which decompression had been performed. In five cases a necrosis of the entire cellular system, especially marked in the apex, was found, and in one the cells were filled with a dark clear fluid; in six cases the greatest number of the cells were normal, but at the apex of the mastoid process and particularly around the stylomastoid foramen a large area of bony necrosis was encountered. On microscopic examination bony necrosis was demonstrated, but there were no signs of inflammation. Similar but less pronounced alterations were found in the wall of the bony Fallopian canal in 18 cases; in two, however, the bony necrosis was so extensive that the facial nerve had been exposed to view. Concerning the nerve, Kettel found that in 28 cases, or 56% of the total, the nerve was unquestionably edematous macroscopically, in two it was possibly atrophic, and in one the changes were so violent that the

1. Ballance, C., and Duel, A. B.: The Operative Treatment of Facial Palsy, Arch. Otolaryng. **15**:1 (Jan.) 1932.

2. Kettel, K.: Bell's Palsy: Pathology and Surgery, Arch. Otolaryng. **46**:427 (Oct.) 1947.

3. Hilger, J. A.: The Nature of Bell's Palsy, Laryngoscope **59**:228, 1949.

4. Sullivan, J. A., and Smith, J. B.: The Otological Concept of Bell's Palsy and Its Treatment, Ann. Otol. Rhin. & Laryng. **59**:1148, 1950.

5. Cawthorne, T.: Peripheral Facial Paralysis: Some Aspects of Its Pathology, Laryngoscope **56**:653, 1946.

continuity of the nerve was completely interrupted (Case 5). In the latter the microscopic examination revealed edema of the nerve trunk, fibrinous exudation, fresh hemorrhage, and marked degeneration of axis-cylinders and medullary sheaths. In the nerve sheath a small vein containing organized remnants of a thrombus and an accumulation of fluid consisting of edema and fibrin between the nerve and nerve sheath could be observed.

From his observations Kettel concludes that the ischemia near the stylomastoid foramen, which is considered the cause of Bell's palsy, in most cases affects the nerve only as the most susceptible tissue; in other cases, however, the surrounding more resistent bone is also affected, the result being an ischemic bony necrosis.

Flodgren [6] has published a report of a case of Bell's palsy with alterations in the cells of the mastoid process like those described by Kettel. The following three cases also confirm the results of Kettel's investigations.

REPORT OF CASES

CASE 1.—A girl 17 years of age whose past history had been generally without significance was admitted to the hospital on July 2, 1948, with a complete peripheral facial palsy on the right side which had lasted for two months without any subsequent improvement and which for the first few days had been accompanied with pains in the right ear. She had had short wave therapy and had taken vitamins B and C without any result. On admission the galvanic response was positive, the faradic response negative.

On July 12 a resection of the right mastoid cells and a decompression of the facial nerve were performed. A clear exudate was found in the cells at the tip of the mastoid process and adjacent to the facial canal. The bone near the stylomastoid foramen was definitely soft; the wall of the Fallopian canal, however, was hard. On decompression the nerve swelled to twice its size, being distinctly edematous. Immediately after the operation the patient was able to close her eye, and rapid recovery followed.

CASE 2.—A woman 34 years of age with a history generally without significance was admitted to the hospital on Dec. 12, 1949. Two months previously a complete peripheral facial palsy on the right side had developed. She had had galvanic treatment but without any result. The faradic reaction was negative. On December 28 a resection of the mastoid cells and a decompression of the facial nerve were done. The cells of the entire mastoid process were considerably moist, and near the stylomastoid foramen some larger cells containing a yellow serous fluid and an edematous mucous membrane were found. On the opening of the Fallopian canal, the facial nerve bulged outward like a hernia. The sheath was heavily swollen and rather irregular in appearance, and after it was split the nerve swelled to double its size. There was rapid recovery.

CASE 3.—A woman 65 years of age was admitted to the hospital on Jan. 23, 1950. She had suffered since 1940 from diabetes mellitus, and in 1949 she had had a transient facial palsy on the left side. In the beginning of December, 1949, she had been exposed to draught, and after this a complete peripheral facial palsy developed on the right side. She was treated conservatively without any results. On admission the palsy was complete and the faradic reaction negative. On Feb. 11 a decompression of the right facial nerve was performed. The bone around the stylomastoid foramen was definitely soft; the wall of the Fallopian canal was, however, hard. The nerve sheath was swollen and the nerve highly edematous from the bend at the lateral semicircular canal to the stylomastoid foramen. Immediately after the operation the patient was able to move her eyelid transitorily, but soon there was rapid recovery.

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6. Flodgren, E., in discussion on Surgery of the Facial Palsy, Nord. Med. (Hygiea) **31**:2159, 1946; A Case of Nerve Suture with "Rerouting" of the Facial Nerve, ibid. **31**:2159, 1946.

SUMMARY

Three cases of Bell's palsy in which a resection of the mastoid cell and a decompression of the facial nerve were done are reported. In all cases an exudate was found in the cells at the tips of the mastoid process and in one some larger cells contained a yellow serous fluid. The bone near the stylomastoid foramen was definitely soft and the facial nerve highly edematous.

These observations confirm the results of previous investigations by Kettel and support his view that Bell's palsy is due to an ischemia near the stylomastoid foramen, which in most cases affects the nerve only as the most susceptible tissue and in other cases the surrounding, more resistant bone.

Norrköpings Lasarett.

FACE-LIFT OPERATION BY ROTATION FLAPS

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IRVING B. GOLDMAN, M.D.
HARRY NEIVERT, M.D.
AND
ALFRED SCHATTNER, M.D.
NEW YORK

IN THE past 50 years there has been an upward shift in the age structure of our population. This trend has brought about perplexing economic, psychological, and sociologic problems. According to the United States Census Bureau, the nation is aging rapidly.[1] Between 1930 and 1940 the total population increased 7.2%, while the group of persons aged 65 and over increased 35%, roughly five times as rapidly as the general population.[2] Conservative estimates are that by 1980 more than 40% of our population will be over 45 years of age. Piersol and Bortz [3] pointedly say, "it is for science not only to add years to life, but more important, to add life to the years." The surgeon with special knowledge of the anatomy of the head and neck and with adequate training in plastic surgery can relieve the geriatric and psychosomatic services of part of their burdens, for he has in his armamentarium knowledge of palliative reconstructive procedures capable of ameliorating one of the most distressing outward manifestations of senescence—the aging skin.

The benefits that accrue from a facial rhydectomy are manifold. In the past few years much of the prejudice formerly felt against this operation has been dispelled as a result of the beneficial effects observed in properly selected cases. Obviously age cannot be measured in terms of years, for biological and chronologic age are not necessarily identical.[2] Some persons are old at 45, whereas others remain young at 65. Furthermore, the course of senescence is not uniformly progressive. Involution may be accelerated in some structures while it is retarded in others. Often the acceleration overtakes the skin in persons who are still vigorous and productive but whose employment demands esthetic as well as occupational adequacy. These unfortunates, because of their aged appearance, are denied the privilege of pursuing the only career for which they feel they possess a special skill and training. There are also those who, forced into compulsory retirement

1. Population Statistics: National Data, Washington, D. C., United States Government Printing Office, October 1937. The Problem of a Changing Population, Report of the Committee on Population, Washington, D. C., United States Government Printing Office, May 1938.

2. Stieglitz, E. J.: Geriatric Medicine, Diagnosis and Management of Disease in the Aging and in the Aged, Philadelphia, W. B. Saunders Company, 1943.

3. Piersol, G. M., and Bortz, E. L.: The Aging Process: A Medico-Social Problem, Ann. Int. Med. **12**:964 (Jan.) 1939.

because of age, find their resources inadequate and are compelled to seek reemployment. This group is definitely handicapped, for industry gives preference to younger-appearing applicants. If these persons can be made occupationally acceptable, not only their mental outlook will be improved but also the tax on the public treasury will be reduced.

From a psychological and sociologic standpoint, advancing age demands many readjustments. The inability to make these readjustments may result in emotional conflicts. Senescence engenders fear of a purposeless existence, insecurity, and a loss of social respect. If some of the stigmas of involution can be removed, much may be accomplished to restore self-confidence and give the person the feeling that, although he is at somewhat of a disadvantage, he is still part of the world of affairs and able to participate in active community life.

Aside from the economic, psychological and sociologic aspects, the purely esthetic indication for the operation can by no means be ignored. As long as society continues to put a premium on youth and to discount the experience that comes with maturity and until such time as new and truer human values are evolved, men and women will persist in their search for ways and means to camouflage their age. It is indeed a powerful motive that brings a patient not suffering from disease or pain to the surgeon for a "face-lift," and such an individual is entitled to sympathetic consideration.

Finally, there are distinct pathological indications. For example, in the suspension operation for facial paralysis it is necessary to excise the redundant stretched skin. In the multiple scars and pitting following acne and other skin diseases, stretching of the skin helps to conceal the disfigurement. There are numerous other indications as well. The commonest are wrinkles following sudden loss of weight, irradiation, and premature atrophy of the facial skin (blepharochalasis in the young). Frequently it is convenient to do a "face-lift" to obtain dermal grafts to suspend a facial paralysis.

Owing to the complexity of the factors entering into the indications, each patient must be chosen with honest discrimination and critically studied with a view to determining whether or not surgical intervention will be of actual benefit. Care is required to rule out those with recessive or inadequate personalities, who use their aging skin as a defense mechanism, as well as prepsychotic and psychotic persons in whom the disfigurement constitutes the factual basis for the psychosis. The psychiatric service can aid the surgeon in recognizing such potential reactions.

PATHOLOGY

The first visible manifestations of approaching senescence are usually observed in the skin, and because of its cosmetic importance it has received considerable attention, largely unscientific in character.[4] The aging process itself has been neglected. We are ignorant of its nature, of the reason for its existence, and of the factors which either accelerate or retard its course. We know little of its biochemistry. We do not know to what degree the changes depend on the genetic constitution or how much the aging process is due to the accidents of living. All we do know is the visible morphologic alteration marking the passage of the years.

4. Rattner, H.: Disorders of the Cutaneous System, in Stieglitz.[2]

The common changes in the skin due to age are too familiar to require elaboration. Briefly, they comprise—according to Carlson [5]—(1) gradual tissue desiccation, (2) gradual retardation of cell division, capacity for cell growth, and tissue repair, (3) cellular atrophy, cellular degeneration, increased cell pigmentation, and fatty infiltration, and (4) gradual decrease in tissue elasticity and degenerative changes in the elastic connective tissue.

The wrinkling of the skin is due to a gradual diminution of the underlying skeletal and muscular volume, together with a general loss of elasticity. The skin becomes permanently overstretched as a result of the activity of the mimic musculature and in the absence of elastic properties hangs in folds and tends to gravitate over the lower parts of the face. At the symphysis, however, it is firmly adherent and does not participate in the sagging process, giving rise to the so-called tricornered chin. Along the nasolabial grooves the connective-tissue fibers break and, in places where they adhere to the subjacent structures, form deep trenches separating the mouth from the overhanging cheeks.[6] The skin of the eyelids becomes

Fig. 1.—Senile wrinkles of face in relation to underlying muscles. Arrows indicate direction of ptosis.

thin and lies in folds, that of the upper lid often hanging below the palpebral margin and that of the lower forming pouches beneath the eyes. *Pari passu* with the sagging process, the subcutaneous fat becomes redistributed, disappearing in the upper region of the face and accumulating in the lower part. The facial muscles undergo fibrosis and exert undue tension on the skin to which they are attached. Thus transverse wrinkles appear across the forehead above the course of the epicranius, two vertical folds form between the eyes over the corrugator and the procerus, and at the outer canthus a fan-shaped arrangement of fine lines develops above the muscles inserted into the orbicularis oculi. The skin over the masseter may present a vertical wrinkle along its anterior border. Around the mouth there forms a characteristic arrangement of lines owing to the fan-shaped insertion of the muscles into the orbicularis oris. The zygomaticus, which normally raises the

5. Carlson, A. J.: Principal Physiologic Changes with Normal Aging, in Stieglitz.[2]

6. Fomon, S.: The Surgery of Injury and Plastic Repair, Baltimore, William Wood & Company, 1939.

corner of the mouth and deepens the nasolabial fold, and the depressors of the angle of the mouth, which draw the orbicularis downward and depress the lower

Fig. 2.—Results following the procedure described (courtesy of Dr. Solomon P. Schechter).

lip, also give rise to characteristic wrinkles. In the neck the fibrosis of the platysma causes the cheeks to hang down like "dewlaps." During forced contraction, fibrous

cords stand out in ridges, and in periods of relaxation the skin below the mandible either sinks as a pure redundancy or becomes "doubled" from the accumulation of fat (Figs. 1 and 2).

The skin loses its velvety thickness and assumes a lusterless tinge of yellow or brown, and often telangiectatic blood vessels can be seen coursing beneath its surface. It is at first dry and harsh, due to atrophy of the sebaceous and sudoriferous glands. Later the skin becomes thin, smooth, and glossy as a result of degeneration of the hair follicles and flattening of the papillae (Fig. 3). In time it assumes the appearance of dry, rumpled tissue paper. Nonelevated pigment patches of a yellowish-brown color frequently develop and are commonly referred to as senile spots or freckles.

MANAGEMENT

Owing to the difference of opinion as to the advisability of the face-lift operation, surgeons have been reluctant to report their experiences. In consequence, there has not been the same pooling of ideas and techniques as in rhinoplasty. For this reason the operation is not so well crystalized that one can be dogmatic. The

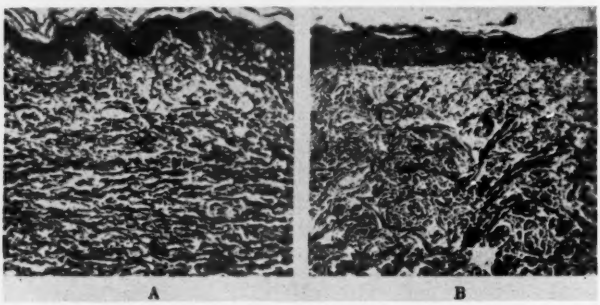

Fig. 3.—Photomicrograph of skin. *A*, normal skin, showing abundant black-stained elastic fibers and well marked papillae and *B*, aged skin, showing disappearance of the black-stained elastic fibers from deeper layers of the derma and atrophy and disappearance of the papillae. (Jean Oliver)

need for research in the field is becoming increasingly urgent, for, as mentioned above, the number of persons past the meridian of life is steadily mounting in our population.

Before surgery is undertaken, the patient should be informed as to the probable results and their duration as well as the potential complications. In one whose nasolabial folds are deep and attached to the subjacent tissues, operation frequently falls short of giving full satisfaction. Likewise in the type characterized by fatty infiltration, with irregular deposits between the angle of the mouth and the lobule of the ear, the benefits obtained may be too transitory to compensate for the inconvenience endured, inasmuch as the fatty deposits will tend to reappear. The most promising results may be anticipated in the patient whose skin hangs in folds and shows a minimal degeneration, no scars, and but little fatty infiltration.

The average duration of the beneficial effects, even with the best technical skill, cannot be expected to exceed three to five years, depending upon age, profession, living conditions, mental habits, hereditary predisposition to skin degener-

ation, and changes in body weight. Obviously, the operation does not remove the causative factors of the aging process. It merely sets the clock back but does not stop the ticking, and perhaps can best be compared to the painting of a house. The patient should be informed that the immediate effect is always good, but that as the involutional process progresses there will be a gradual re-formation of wrinkles, necessitating a repetition of the operation. The results of subsequent surgery, however, are likely to be less transitory, since after each revision the elasticity of the skin is reduced. This probably accounts for the more lasting effects in older persons.

Each person presents an entirely different problem, and no single plan of repair is applicable to all. Therefore, before embarking upon the operation, the surgeon should carefully study the patient in hand and formulate an exact plan of procedure. A general idea as to the amount of tissue to be excised can be obtained by placing the patient in front of a mirror and pulling the skin upward, backward, and forward in various planes, noting the effect of this or that manipulation on the forehead, eyelids, cheeks, nasolabial folds, and neck. If the changes are not marked, the surgery is done in one stage; if marked, it is performed in two stages. In the first operation the eyelid and forehead wrinkles are corrected, as well as those of the temporal and upper facial region. At the second stage, three weeks later, the wrinkles in the malar, mandibular, and cervical areas are eradicated.

If the ultimate scar is to be inconspicuous, the incision must necessarily be placed at some distance from the deformity, and since this entails a considerable amount of undermining—the greatest hazard in this type of operation—the difficulty lies in selecting a site which will conceal the scar and at the same time reduce the amount of undermining to a minimum. For the removal of wrinkles limited to the upper part of the face the incision can be easily hidden within the hairline of the temporoparietal region, and for the eradication of those above the angles of the mouth and in the neck it can be concealed behind the ear and in the occipital scalp; but for the elimination of wrinkles of the cheek the problem becomes more difficult. In this case the interposed auricle would preclude the possibility of hiding the scar in the hairline. Furthermore, the auricle offers the added disadvantage of being too mobile to furnish adequate fixation for the flap. With a view to overcoming these difficulties, numerous incisions and techniques have been devised.

OPERATIVE TECHNIQUE

In operations designed for the eradication of facial wrinkles the problems are (1) to determine the amount of tissue to be excised to obtain the desired effect without causing the patient's face to assume the fixed expression of a wax figure, (2) to hide the line of incision and at the same time minimize the amount of undermining, (3) to rotate the flaps in such a way as to take up the slack, and (4) to anchor the subcutaneous structures so as to relieve tension on the skin. Eradication of the wrinkles merely by excision of the skin offers such transitory results as scarcely to justify the operation. The procedure about to be described is in our opinion best suited to accomplish the objectives mentioned above.

Preparation and Anesthesia (Fig. 4).—The hair along the prospective line of incision is shaved, a drop or two of sterile castor oil is introduced into the eyes, the auditory canals are packed with cotton, and the skin is prepared in the customary manner. The head is then draped in such a way that the face is exposed to full view, and the parts are anesthetized. General anesthesia is contraindicated, as it abolishes the powers of facial expression and

prevents the observance of the effects of this or that traction, thus interfering with judgment in the reconstruction. Satisfactory anesthesia is obtained by raising a series of wheals along the line of incision and introducing through these wheals eight to 10 needles at equidistant points.

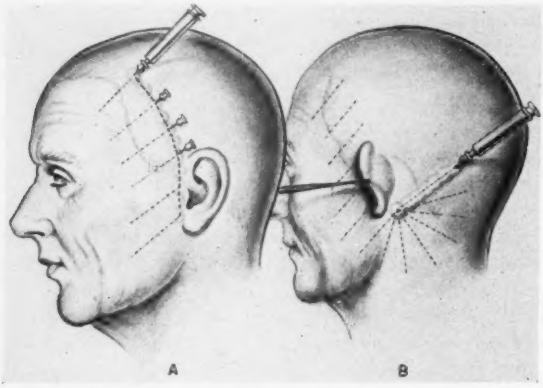

Fig. 4.—Anesthesia. *A*, series of parallel infiltrations made 1 to 2 cm. apart, beginning in the temporal region and extending to the lobule of the ear and *B*, neck and occipital scalp infiltrated.

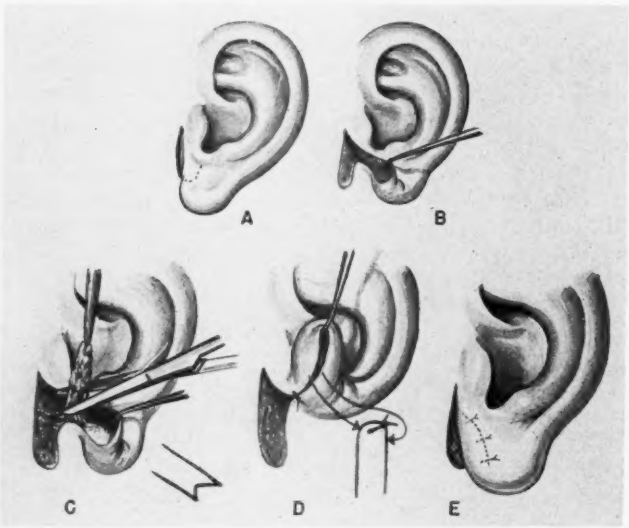

Fig. 5.—Separation of lobule from face. *A*, incision around lobule; *B*, lobule separated from face; *C*, subcutaneous tissues excised in form of a trough with anterior margin left wider and thicker so that the scar will be concealed posteriorly; *D*, wound margins approximated, and *E*, scar lying posteriorly.

The tissues are infiltrated horizontally to a point in front of the outer canthus and to the angle of the mandible, neck, and occipital scalp, the solution being injected as the needle is withdrawn.

The anesthetic agent used is butethamine (monocaine®) hydrochloride solution, 1.5%, with epinephrine solution 1:30,000—20 to 30 cc. usually being sufficient.

Detachment of Ear Lobule (Fig. 5).—The first step in the operation is to move the lobule from the line of incision to prevent its subsequent displacement when the scar contracts. An incision is begun just below the incisura intertragica anteriorly and continued beneath the lobule, ending at a corresponding point on its posterior surface. The lobule, thus detached, is elevated from the face with a dural hook, and the skin margins are united with interrupted atraumatic sutures. Approximation of the lobular edges is facilitated if some of the intervening sub-

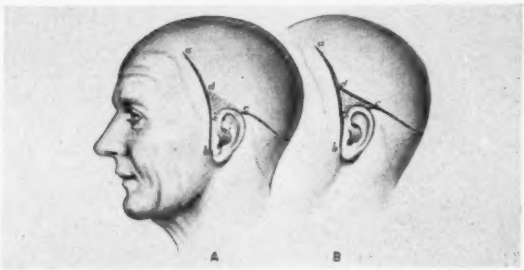

Fig. 6.—Incision. *A*, incision beginning 2.5 cm. within the hairline, carried to the helix along the border of the tragus to end opposite the site of the previously detached lobule, and thence behind the ear into the parieto-occipital scalp. Limbs of *V* (*a*, *b*, *c*) are connected by two incisions (*dc*, *ec*). *B*, the triangular section (*d*, *e*, *c*) above the excised.

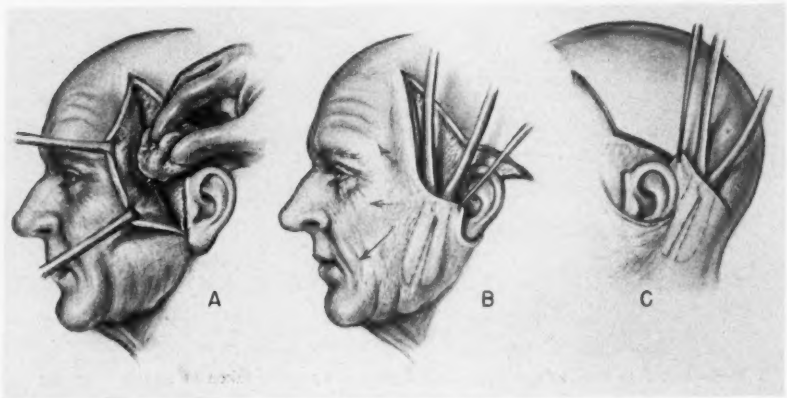

Fig. 7.—Separation of flaps. *A*, anterior flap elevated in plane above fascia with work done against undersurface of skin; *B*, undermining continued below mandible, and *C*, occipitocervical flap separated. Details are given in the text.

cutaneous tissue is excised in the form of a trough, and the scar can be concealed posteriorly if the anterior margin is left slightly wider and thicker than the posterior one.

Incision (Fig. 6).—The incision penetrating skin and subcutaneous tissue is begun in the temporoparietal region 2.5 cm. within the hairline and is carried down to the ventral attachment of the helix. From there it is directed along the anterior margin of the ear, ending at the point of the previous detachment of the lobule, from whence it is carried upward within the hairline behind the ear and extended along the hairline of the parieto-occipital region. The incision when completed takes on the form of a V, one limb lying anterior and the other posterior to

the auricle. The limbs of the V are then connected by two parallel incisions, one immediately above the upper attachment of the auricle and the other 2.5 cm. above it. The intervening triangular section of skin is excised.

Detachment of Flaps (Fig. 7).—The anterior flap is elevated by blunt dissection, the work done against the undersurface of the skin. In this way bleeding is reduced to a minimum, and the danger of damage to filaments of the facial nerve, the parotid gland, and the parotid duct is avoided.

The extent of undermining is regulated by the amount of rotation necessary to overcome the wrinkles. Ordinarily, it is carried anteriorly to the outer canthus and to the nasolabial fold and downward to the angle of the jaw. The posterior flap is elevated down to the clavicle.

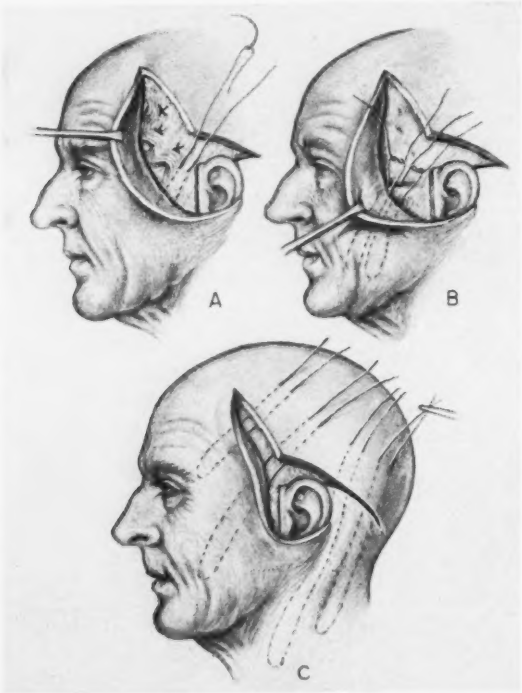

Fig. 8.—Relief of skin tension. *A*, fascia tightened by tucks taken at strategic points; *B*, deep tissues of cheek supported by two sutures introduced at limit of skin undermining and looped over the zygoma, and *C*, suture line supported by tantalum loops carried through the muscle and brought out through the scalp above the line of incision.

There sharp dissection is necessary to cut the fibrous septa extending from the platysma to the skin. Hemorrhage is not marked and can be easily controlled by ligation with fine absorbable surgical suture. Oozing from smaller vessels may be checked by clamps or hot compresses. Bleeding from the scalp is arrested with Adson's clips or by picking up the galea beneath the severed vessels with forceps placed 1 cm. apart and turned over the edge of the scalp. This throws the aponeurosis over the bleeding points, and the weight of the instruments is sufficient to check the hemorrhage. In any case hemostasis must be complete; otherwise the collection of blood beneath the skin may lead to disturbing consequences.

three organisms, with most members of the family exhibiting all. An analysis of the organisms involved showed hemolytic staphylococci 14 times, hemolytic streptococci 7 times, and the combination of these two 2 times. In one instance a combination of hemolytic staphylococci and H. influenzae was noted.

COMMENT

The limitation of the method employed has been described.[1] Unquestionably, a single method of isolating an organism has definite limitations, and a single source of material for culture is not conducive to accuracy. The in vitro inhibition test eliminates the role of the host, a factor which cannot be ignored in interpreting

TABLE 4.—*Evaluation of Possible Contagious Relationship of Organisms Obtained from Sixty-Three Cultures from Material from Twenty-Two Families*

Number of Members of Family Studied	Complete	Incomplete	Possible Contagion	Organisms Involved
2	..	+	..	.....
5	+	..	+	P. vulgaris, Hem. staphylococci
2	+	..	..	.....
3	+	..	+	Hem. staphylococci
2	..	+	..	.....
2	..	+	+	Hem. streptococci
4	+	..	+	Hem. staphylococci, H. influenzae
3	+	..	+	Hem. streptococci, P. vulgaris
5	+	..	+	Hem. staphylococci
4	+	..	+	Hem. staphylococci
2	..	+	+	Hem. streptococci
2	+	..	+	Hem. staphylococci
2	..	+	+	Hem. staphylococci
2	..	+	+	Hem. staphylococci
4	+	..	+	Hem. staphylococci, Hem. streptococci
5	+	..	+	Hem. staphylococci, Hem. streptococci
3	+	..	+	Hem. staphylococci, Hem. streptococci
2	..	+	+	Hem. staphylococci, Hem. streptococci
2	..	+	..	.....
2	..	+	+	Hem. staphylococci
2	..	+	..	.....
3	+	..	+	Hem. staphylococci
63	12	10	17	

therapeutic results. Errors also arise from the arbitrary selection of the test strengths of the various antibiotics, which approximated achievable in vivo concentrations. Stronger concentrations could conceivably change the findings herein recorded. In spite of these limitations, it has been confirmed in clinical practice that the performance of an inhibition test is at times essential. The inhibition test is becoming increasingly more essential with the development of greater resistance, as noted in the observations recorded in the present studies compared with those previously reported. Clinically one of us (S. J. P.) has observed, for example, that one of the most difficult organisms to overcome in treating chronic infection was the hemolytic Staphylococcus.[3] Normally, this organism would be considered

3. Prigal, S. J.: Bacteriologic and Epidemiologic Approach to the Treatment of Respiratory Infections: Series III. Clinical Studies, to be published.

responsive to penicillin, bacitracin, aureomycin, or terramycin. Nevertheless, it was noted that a group of hemolytic staphylococci were insensitive to all these antibiotics with the exception of streptomycin. A simple culture and smear as a basis for decision without the inhibition test would have been deceiving. There is an overlapping of antibacterial activity of all the antibiotics studied; nevertheless, each of the antibiotics shows exclusive action against a species of organism, so that in any clinical problem the proper antibiotic can be selected only by bacteriological tests.

As observed in these studies, the number of uninhibited organisms is still formidable, despite the newer wide-range antibiotics, making random choice of an antibiotic hazardous. Fortunately, patients recover because of the production of "immunity," since patients did recover, in the majority of instances, from infections before the advent of antibiotics. The large amount of noninhibition should lead to further studies of the mechanisms involved in development of resistant strains and their possible reversal, the development of newer antibiotics, and the employment of combinations of antibiotics to overcome the deficiency.

We noted in the present series 13 organisms completely insensitive to any of the antibiotics. This is an incidence of 3.9% of the total compared with an incidence of 1.8% (as previously reported), an increase of approximately 100%, despite the availability of terramycin. Included in the nonreactors were hemolytic streptococci, hemolytic staphylococci, P. vulgaris, and B. pyocyaneus. It is possible that the wide dissemination of such organisms apparently not readily inhibited by the antibiotics could lead to serious morbidity. These observations would seem to indicate that we are encountering resistant strains more frequently; on the other hand, we have noted a sharp reduction in the incidence of D. pneumoniae in this series as compared with the original observations. Although the reduction may be largely due to seasonal variations, it is also possible that the continued use of potent antibiotics against this extremely sensitive organism has resulted in a marked reduction of the species. The reduction of D. pneumoniae is paralleled by the clinical rarity of lobar pneumonia today.

The specific action of each antibiotic leads to a consideration of the drop in efficiency of aureomycin as noted in the present series. Thus, aureomycin which had originally been ranked as the highest with 80% efficiency has now an efficiency of only 36%, only slightly above that of streptomycin. Penicillin, which is used so commonly that one would expect development of a greater degree of resistance, shows a fall in efficiency from 73% to 56%. The same type of phenomenon was observed with bacitracin. It is difficult to account for the observations with aureomycin, considering the fact that in in vitro studies resistance to aureomycin is not as readily produced as resistance to penicillin or streptomycin.

Terramycin deserves special consideration since this antibiotic was used in these studies for the first time, and it unquestionably has revealed in vitro potency of the highest order as compared with the potencies of the other antibiotics. Terramycin in this fashion behaved similarly to aureomycin when tested in the original series. It remains to be seen whether or not the continued clinical use of terramycin will result in a lower efficiency similar to that noticed with aureomycin.

The clinical application of the bacteriological and epidemiologic approach described above will be reported elsewhere.[3] It is of value, however, to make brief observations at this time, first on the value of employing bacteriological methods in obtaining better therapeutic results and second on the correlation between chronicity

of respiratory infections as we have seen them and the occurrence of organisms which show in vitro resistance even prior to treatment. At times these organisms may show the phenomenon of partial or temporary inhibition. It would seem as though in their struggle for survival they have developed techniques of combating and overcoming the various antibacterial agents (including antibiotics produced by one organism against the other) to which they have been exposed.

In the consideration of the epidemiologic aspects of this study we have succeeded in obtaining more complete family studies as compared with the original series. As a result of the present observations, it has become more evident that contagion plays an important role in reinfection or the maintenance of infection in sinorespiratory disease, particularly as observed in children. Here again, the organisms oftenest involved are hemolytic staphylococci and streptococci, although there is by no means limitation to these. It was noted in the present series that 17 of 22 families showed bacteriological evidence of the possibility of the existence of a contagious state.

Another phenomenon relative to contagion noted clinically was the occurrence of blepharitis in the patient or in members of the family. Material for cultures taken from the eye with but one exception revealed the organism to be identical to the one cultured from material from the patient's throat and implicated as the causative agent. This phenomenon has been observed in 14 instances. There is the possibility that greater attention paid to chronic conjunctivitis or blepharitis and the treatment thereof may reduce the incidence of reinfection in the patient and within the family group. Clinically, we have found it necessary at times to treat other members of the family in order to improve the health and welfare of the patient.

The question of the carrier state and the role it plays in maintaining infection or causing reinfection has not been emphasized sufficiently in the consideration of sinorespiratory infections. The morbidity rate is sufficiently high to warrant closer scrutiny along these lines.[4]

Our studies have indicated the tendency of certain organisms to establish themselves within the family unit in which chronic infections exist. Apparently an equilibrium has been reached in the patient at the latter's expense, but the infection is not sufficient to threaten life except under the influence of an additional infecting agent or in case of marked debilitation with lowered resistance. Other members of the patient's family may harbor the same organism, but the equilibrium has not been altered owing to the patient's "immunity." In such a case illness or disease is latent. We have encountered in one family a girl of 9 years of age suffering from asthma due to allergic and infectious factors. The patient harbored a hemolytic Staphylococcus in the pharynx and on the eyelids (from blepharitis since early childhood). Two younger sisters harbored the same organism and both showed bilateral cervical adenitis but were not ill, possibly because they did not seem to be allergic and possibly because they had a greater "immunity." In either case they had a latent infection. Should they be treated although apparently well? It would seem logical to do so, not only for their sakes but also for the sake of their sister who was allergic and apparently had less "immunity" and was, therefore, vulnerable to organisms which they harbored with impunity, disseminating them in the household as they kissed, coughed, sneezed, etc.

4. Prigal, S. J.: Bacteriologic Environment in Chronic or Repeated Infections, Letters to the Editor, J. A. M. A. **144**:1585 (Dec. 30) 1950.

SUMMARY

1. One hundred seventy-four cultures from material obtained from patients suffering from sinorespiratory infections yielded 332 isolates. Hemolytic staphylococci and streptococci were dominant.

2. A comparison of the present series with the series of an earlier study shows a greater incidence of organisms which are more resistant to the antibiotics.

3. The in vitro actions of penicillin, bacitracin, streptomycin, aureomycin, and terramycin against these organisms were grouped into three categories: complete inhibition, no inhibition, and partial or temporary inhibition.

4. Of all organisms isolated, 3.9% were not inhibited by any of the antibiotics, according to the test. Other evidence also indicates a wide area of ineffectiveness of the five antibiotics against organisms cultured from sinorespiratory infections.

5. Consideration is given to the use of bacteriological methods including the in vitro inhibition test to determine the choice of an antibiotic for specific therapy.

6. Epidemiologic studies of chronic sinorespiratory infections and their relation to the carrier state within the family are analyzed. Blepharitis has been implicated as a focus of infection and reinfection.

CORTISONE IN BEHCET'S SYNDROME

Report on a Patient with Lesions of the Genitalia, Mouth, Pharynx, and Larynx Necessitating Repeated Tracheostomies

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NEW YORK

THIS IS a report of a case of Behcet's syndrome which was unusual in that the severity of the laryngeal lesions produced respiratory obstruction which necessitated repeated tracheostomies.

Behcet's syndrome is a benign systemic disease characterized by recurrent ulcerations of the mouth and genitalia and by uveitis with hypopyon. Involvement of all these structures may occur at the same time, or the syndrome may be manifested by genital and oral lesions alone. In addition to the typical picture, there are often associated signs, such as erythema nodosum, nonspecific skin hypersensitivity, and infectious processes of the skin, muscles, and gastrointestinal tract. When only two of the three classic signs are present, the syndrome is classified as an abortive form, as the picture is identical with that of the fully developed syndrome. In the first report of cases by Curth [1] in 1946, one patient manifested the fully developed triple-complex syndrome, while the other had lesions of the mouth and vulva only.

A Turkish dermatologist, H. Behcet,[2] in 1937, was the first to report the recognition of this condition as a new syndrome, which he called "triple-symptom complex." However, it is evident that the disease had been reported earlier in European literature, although not specifically recognized in itself as a new disease entity.

Behcet believed that the disease was caused by a virus, but no definite cause has as yet been proved. To date, the treatment described in reports of cases has been empirical. Koch [3] recently reported a case of Behcet's syndrome in which there

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Reviewed by the Veterans Administration and published with the permission of the Chief Clinical Director. The statements and conclusions published by the author are the result of his own study and do not necessarily reflect the opinion or policy of the Veterans Administration.

1. Curth, H. O.: Recurrent Genito-Oral Aphthosis and Uveitis with Hypopyon (Behcet's Syndrome): Report of Two Cases, Arch. Dermat. & Syph. **54**:196-197 (Aug.) 1946.

2. Behcet, H.: Über rezidivierende, aphthose, durch ein Virus verursachte Geschwüre am Mund, am Auge und an den Genitalien, Dermat. Wchnschr. **105**:1152-1157, 1937; Considérations sur les lésions aphtheuses de la bouche et des parties génitales ainsi que sur les manifestations oculaires d'origine probablement parasitaire et observations concernant leur foyer d'infection, Bull. Soc. franç. dermat. et syph. **45**:420, 1938; Kurze Mitteilung über Fokalsepsis mit aphthösen Erscheinungen am Mund, Genitalien und Veränderungen an den Augen als wahrscheinliche Folge einer durch Virus bedingten Allgemeininfektion, Dermat. Wchnschr. **107**:1037-1040, 1938; Some Observations on the Clinical Picture of the So-Called Triple Symptom Complex, Dermatologica **81**:73-83, 1940.

3. Koch, H.: Behcet's Syndrome: Report of a Successfully Treated Case, Acta Oto-Laryng. **38**:56-58, 1950.

was response to an antihistaminic drug, "antasten." However, in all other cases mentioned in the medical literature there was no improvement or only slight temporary improvement following any form of therapy. Ragan and associates [4] after the administration of cortisone noted a delay in the development of all elements of connective tissue in a rabbit's ear wound; consequently, it was considered of interest to determine the effects that cortisone had on the development of fibrosis at the sites of the lesions, as well as on the rate of healing, in Behcet's syndrome.

During the past one and a half years we have followed a patient with an abortive form of this syndrome at the Veterans Administration Hospital. The case is unusual in that during acute attacks pharyngeal and laryngeal ulcerations with accompanying edema of these structures have produced respiratory obstruction which necessitated temporary tracheostomies.

REPORT OF CASE

History.—A white man aged 26 was first admitted to the Otolaryngology Section of the Veterans Administration Hospital on June 3, 1949, with the chief complaint of severe dyspnea and dysphonia of two days' duration. These symptoms had been preceded by a sore throat of one week's duration. The past history revealed that the patient had been in good health until 1944, at which time, while in the army in Texas, he experienced his first attack of dyspnea and dysphonia. This episode was also preceded by a sore throat and ulcerations of the lips, palate, and pharynx. At that time he was treated with injections of epinephrine and over a period of one week the dyspnea and dysphonia gradually subsided. Since this initial attack, these episodes of dyspnea and dysphonia, preceded by mucosal ulcerations of the lips, mouth, palate, pharynx, and larynx, have occurred on the average of three to four times yearly. Within the past two years, all the severe episodes have been accompanied by ulcerations on the glans penis and scrotum, which have also subsided within a period of one week.

Physical Examination.—At the time of admission, examination revealed a thin, young, white man with marked respiratory distress. The uvula and tonsils were absent. There was a whitish glass-like appearance of the entire mucosal membrane of the mouth and pharynx. A sharply demarcated ulceration measuring 0.5 cm. was present on the left inner part of the lip at the junction of the vermilion border and the mucous membrane. A circumscribed ulcer, approximately 1 cm. in diameter, was noted on the right posterior pharyngeal wall. The left posterior tonsillar pillar was adherent to the left posterolateral pharyngeal wall. An ulcer approximately 0.3 cm. in diameter was noted on the left lingual surface of the epiglottis. On indirect laryngoscopy, a stenosis of the larynx was noted. The arytenoids, ventricular bands, and true vocal cords were moderately edematous and injected. The true vocal cords moved minimally on phonation and left a small, inadequate glottic chink.

Course in Hospital.—The patient was immediately given an injection of 0.5 cc. of epinephrine hydrochloride 1:1,000 solution, and tripelennamine (pyribenzamine®), 50 mg. every four hours, with no apparent effects. He was also given aerosolized epinephrine and antibiotics, including sulfadiazine, 1 gm. every four hours, 600,000 units of penicillin a day, and aureomycin, 500 mg. every six hours. In spite of these measures over a period of 12 days, the laryngeal edema became progressively worse with almost complete obliteration of the laryngeal airway; consequently, on June 16 a tracheostomy was performed, with immediate relief of the patient's dyspnea. One week later, a direct laryngoscopy was performed, and there was noted a generalized fibrotic process throughout the hypopharynx and larynx with very little motility of the vocal cords, plus a stenosis of the glottic chink. A subglottic web-like band formation was seen extending to the anterior commissure. Biopsy specimens from the subglottic web and from thickened, fibrotic laryngeal mucosa failed to reveal anything more than a chronic nonspecific inflammatory process. From June until November this patient received a very extensive

4. Ragan, C.; Howes, E. L.; Plotz, C. M.; Meyer, K. and Blunt, J. W.: Effect of Cortisone on Production of Granulation Tissue in the Rabbit, Proc. Soc. Exper. Biol. & Med. **72**:718, 1949.

examination from every aspect, and consultations throughout every department of the hospital failed to reveal any systemic disease which could account for these attacks. A complete allergy study revealed a slight sensitivity to dust, and a course of dust desensitization was given. An autogenous vaccine, prepared from the patient's laryngeal secretions, was also given with no improvement. Roentgenograms of the entire osseous structure showed nothing significant. During this period of hospitalization of five months, on two separate occasions ulcerations of the mucosal membranes of the mouth (Fig. 2), pharynx, larynx, penis and scrotum (Fig. 3) developed. With or without any specific treatment these ulcerations all subsided within a period of 7 to 10 days. Since the tracheostomy tube was in situ during these episodes, the patient experienced no attacks of dyspnea.

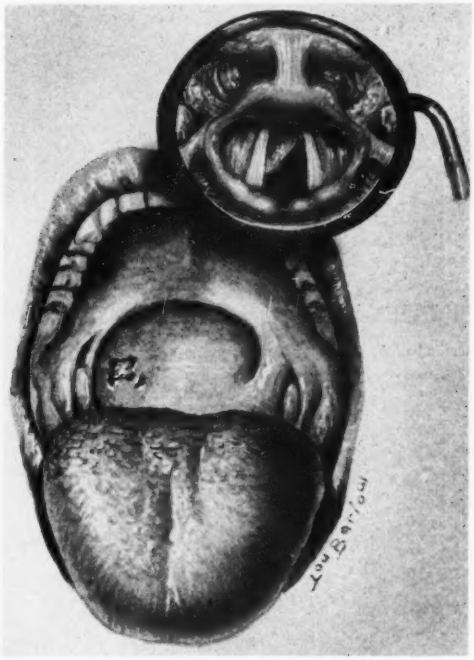

Fig. 1.—View of the oropharynx showing ulceration of right posterior pharyngeal wall and adherence of the left posterior tonsillar pillar to the left posterolateral pharyngeal wall; also, a mirror view of the larynx, showing a subglottic web-like band formation extending to the anterior commissure, as well as a band formation extending from the epiglottis to the base of the tongue.

On November 22, five months after surgery, the tracheostomy tube was removed. After removal of the tube, the patient did well for six days. New ulcerations of the pharynx, larynx, penis, and scrotum then developed, followed by severe obstructive dyspnea, and a repeat emergency tracheostomy was performed. From November to February, 1950, the patient had three serious episodes of ulcerations but between attacks enjoyed good health. In February the tracheostomy tube was again removed.

From February until April, a period of two months, the patient had no attacks, and, despite considerable stenosis of the glottic chink, he encountered no further respiratory distress except on strenuous exertion. However, in April he had another acute episode of ulcerations with

obliteration of the airway, and a third tracheostomy was necessary. The acute symptoms subsided within one week, and in May the tracheostomy tube was again removed. The patient then remained free of symptoms only until July, when he again experienced a typical attack and it was necessary to repeat the tracheostomy for the fourth time within a period of 13 months. On September 1, the tracheostomy tube was removed, and after its removal he remained asymptomatic for seven weeks.

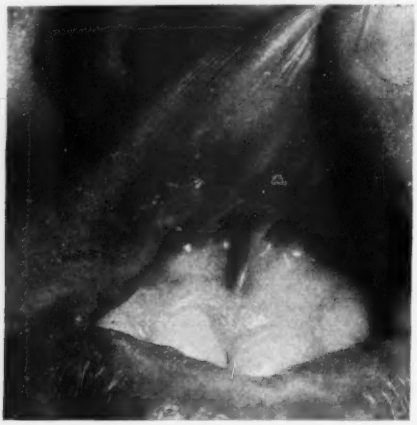

Fig. 2.—Circumscribed ulcer on upper lip at junction of the vermilion border and the mucous membrane.

Fig. 3.—Circumscribed ulcer of scrotum.

On October 20, he was readmitted to the Dermatology Service, with ulcerations of the scrotum, lip, and pharynx. Cortisone therapy was started on the first hospital day: 200 mg. was given on the first day, 200 mg. on the second day, and 100 mg. on the third day. All areas of involvement appeared to heal by the sixth hospital day, which was the same rate of healing as when no cortisone therapy was given.

Relief of Tension on Skin Flaps (Fig. 8).—To prevent skin tension: 1. Tucks are made in the fascia by folds pinched up and secured with fine absorbable surgical suture at strategic points. 2. An absorbable surgical or tantalum suture is made to pick up the deep tissues of the cheek at the limit of the skin-undermining and looped over the zygoma. 3. Finally, a tantalum loop is carried through the muscle and brought out through the scalp behind the incision. The ends are fixed temporarily with hemostats.

Rotation of Flaps and Removal of Excess Skin (Fig. 9).—The anterior flap is grasped with several hemostats and rotated through an arc upward and backward until the wrinkles about the forehead, eyes, nasolabial region, and mandible are obliterated. It is then fixed temporarily to the margin of the original incision by two or three small towel clamps or sutures. The posterior flap is rotated upward and forward until the wrinkles about the lower part of the face and neck are effaced, whereupon it is fixed temporarily to the posterior wound margin in a like manner. At this point in the procedure an idea may be obtained of the final effect. If necessary, a little more undermining may be carried out or the arc of rotation altered by a change in the position of one or more clamps. While a slight overcorrection is advisable to compensate for

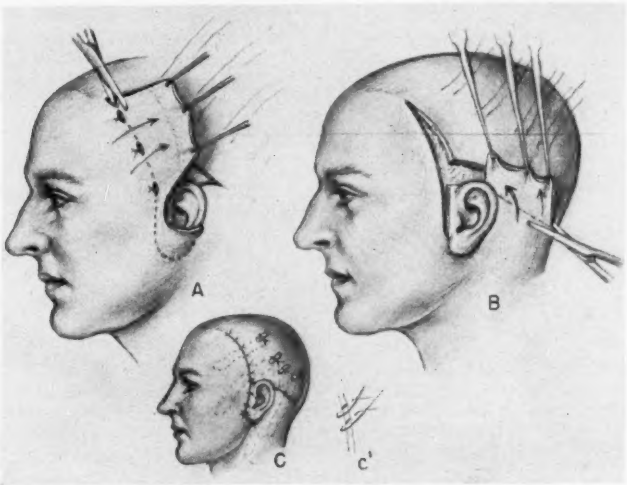

Fig. 9.—Rotation of flaps and removal of excess skin. *A*, anterior flap rotated upward and backward, until wrinkles are eradicated. Arrows show the direction of rotation. Flaps are fixed temporarily to the margins of incision, and excess skin is excised. *B*, the posterior flap is rotated upward and forward until wrinkles of the lower part of the face and neck are effaced. Excess tissue over margins of the incision are excised. *C*, skin margins are closed, and tantalum wire is tied over gauze rolls. *C'*, method of placing sutures to draw mobilized skin upward and backward. Details are given in the text.

subsequent relaxation of the tissues, care should be taken not to efface the normal lines of expression. When the flaps have been adjusted to the satisfaction of the operator, the excess tissue overlapping the margins of the incision is excised.

Fixation of Flaps.—Before the skin margins are coapted, the deep surfaces of the flaps are secured to the inelastic fascia and to the zygomatic, mastoid, and cranial periosteum. This obliterates dead spaces and eliminates tension on the skin edges. The following technique is used: The towel clamps previously placed are removed from the anterior flap, and a half-curved needle threaded with fine absorbable surgical suture is made to take a bite of the fascia, withdrawn, and then passed through the undersurface of the flap at a point lying anterior and inferior to the fascial bite, so that when the suture is tied it will draw the mobile skin upward and backward. Similar sutures are passed from the flap to the temporal fascia, epicranial

aponeurosis and periosteum, zygomatic fascia, and parotid fascia. When all have been passed, they are tied from below up, the effect of each suture being noted and the stitch readjusted if necessary before the next one is tied. The clamps on the posterior flap are then removed, and similar fixation sutures are placed between the undersurface of the flap and the mastoid fascia and underlying periosteum.

Approximation of Skin Margins.—After the fixation sutures have been tied, the skin edges should fall into easy approximation and are united with interrupted nonabsorbable surgical sutures. Each suture is placed in such a way that it lies obliquely across the line of incision, the bite in the skin flap being on a lower level than that in the wound margin, so that when tied the flap will automatically be drawn upward (Fig. 9). The suturing is begun from below and is carried upward both in front and in back of the auricle, care being taken to avoid the incorporation of fat in the suture line, as this poorly nourished tissue has a tendency to undergo necrosis. At the upper extremities of the incisions buckling is overcome by the removal of triangular sections of skin after the method of Burow. The skin closure in front of the ear is accomplished with atraumatic sutures. Finally, the tantalum loops are tied over rolls of gauze, to prevent displacement of the flaps when the patient is talking, eating, or laughing.

The wrinkles on the opposite side of the face are treated in a similar manner. Throughout this stage of the operation frequent comparisons should be made with the corrected side for the

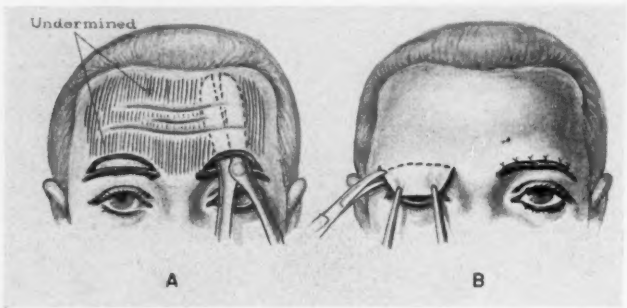

Fig. 10.—Removal of forehead wrinkles. *A*, incision made along the upper margin of the eyebrow. Forehead skin undermined with blunt scissors and fibers of epicranius cut. Vertical lines indicate extent of undermining. *B*, forehead skin drawn down until wrinkles disappear. The excess skin excised and wound margins closed.

purpose of securing symmetry. It is seldom that both sides of the face are equally wrinkled. Hence it is usually necessary to remove a little more skin on one side than on the other.

Dressing.—The suture line is covered with petrolatum gauze, and this is overlaid with pads of gauze and cotton held in place by an elastic bandage carried around the head and incorporating the vertex and chin, with several circular turns about the forehead. Such a pressure dressing inhibits the collection of serum beneath the flap and reduces the edema about the eyes. The patient is placed in bed with a sandbag on either side of the head and is instructed to rest quietly and refrain from talking or laughing. A semisolid diet is prescribed for a day or two. Pain, which is usually negligible, can be relieved by the administration of the ordinary sedatives. Some swelling and edema is to be expected for the first two or three days, and this can be somewhat reduced by the application of ice bags to the part. Any "oriental" distortion present about the eyes usually disappears in a day or two. A rise in temperature of 0.5 to 1 degree F. is common and of no significance. Stretching of the scar may occur if the skin margins have been sutured under tension. In such an event removal of the stretched cicatrix must be postponed until healing is complete.

Removal of Sutures.—As the sutures were placed without tension, those in the preauricular region may be removed in three or four days. The balance of the stitches, being hidden in the hairline and behind the ear, may be allowed to remain for a week to 10 days, after which time

every other one is removed. The rest are removed on the following day. The tantalum loops are withdrawn on the 14th day.

Management of Wrinkles in Special Areas.—Forehead Wrinkles: Inasmuch as forehead wrinkles are invariably associated with drooping of the eyebrows, we employ a procedure which eradicates both defects and at the same time leaves an inconspicuous scar (Fig. 10). An incision is made along the upper margin of each eyebrow, and the forehead skin is separated from the underlying structures with blunt scissors. As a precaution against recurrence of the wrinkles, the epicranial fibers are severed subcutaneously. After free mobilization, the skin is drawn down over the original incisions until the wrinkles disappear. The excess skin is excised and the wound margins approximated.

Glabellar Wrinkles: An incision is made at the inner margin of the eyebrow, the skin is undermined over the glabellar region, the corrugator is cut subcutaneously to prevent recurrence of the wrinkles, and the wound in the eyebrow is closed.

If the wrinkles are deep and the connective-tissue fibers ruptured, correction is best achieved by means of a graft, the transplant being introduced into a previously prepared bed through an incision at the inner corner of the eyebrow. Dermal grafts best serve the purpose (Fig. 11). The wound in the eyebrow is then closed.

Lower-Eyelid Wrinkles: Before the removal of pouches in the lower eyelid is undertaken, constitutional conditions, such as kidney and heart disease, must be excluded as causes of the bagginess. Pathologically, two varieties of lid pouches are recognized: 1. Blepharochalasis,

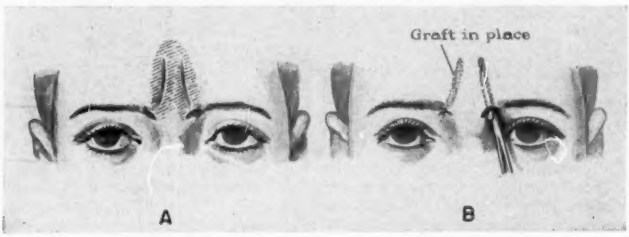

Fig. 11.—Eradication of glabellar wrinkles. *A*, bed prepared through incisions at inner extremities of eyebrows and *B*, dermal graft introduced.

described by Fuchs[7] in 1896, is characterized by atrophy and stretching of the skin, the lids assuming the appearance of rumpled tissue paper. In this type merely excision of the redundant skin is all that is necessary to overcome the disfigurement. 2. Ptosis adiposa, first described by Sichel, is characterized by a senile relaxation of the tarso-orbital fascia. The weakened fascia is pushed forward by the orbital fat and in time gives way, allowing the fat to protrude between the fibers of the orbicularis muscle and form a pouch beneath the skin. In this type merely excision of the excess skin would fail to effect a permanent correction, since the defect remaining in the tarso-orbital fascia would soon bring about a recurrence of the disfigurement.

In cases in which the deformity is merely due to a redundancy of the skin, the following procedure is employed (Fig. 12): An incision parallel to the lid margin and 1 to 2 mm. below it is carried from canthus to canthus. The site for this incision is important, for if it is placed too high, there is danger of ectropion, and if too low, a visible scar will result. To prevent buckling and afford the necessary support to insure against ectropion, the upper incision is prolonged outward for about 1.5 cm. The skin is undermined to the infraorbital margin. To favor rotation of the flap, a strip of skin is excised in the form of a crescent which should not exceed 3 or 4 mm. at its widest part. In the vicinity of the inner canthus very little skin should be removed, lest there follow an eversion of the punctum. It is better to carry out a subsequent operation and excise another small strip than chance ectropion by the removal of too much at one time.

7. Fuchs, E.: Textbook of Ophthalmology, translated by A. Duane, Philadelphia, J. B. Lippincott Company, 1924.

The balance of the redundant skin is then rotated outward by an oblique stay suture carried from the outer canthal ligament to the lower flap. The buckle remaining is excised in the form of a triangle after the method of Burow. The edges of the wound are approximated with atraumatic sutures, which are passed obliquely to take the tension off the stay suture. The patient is instructed to wear smoked glasses for a day or two. The sutures are removed in three to four days. Since the scar is hidden by the eyelashes, it will be imperceptible.

If the pouch is due to a herniation of the intraocular fat, an external incision is carried from canthus to canthus, as previously described, and the skin is undermined to expose the orbicularis oculi muscle, the fibers of which are bluntly separated until the tarso-orbital fascia comes into

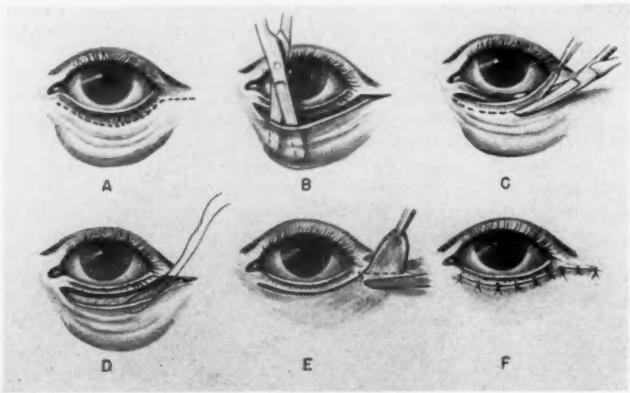

Fig. 12.—Removal of lower-eyelid pouches. *A*, incision carried from canthus to canthus 1 mm. below and parallel to lid margin and extended along natural crease; *B*, skin undermined to infraorbital margin; *C*, strip of skin removed, to favor rotation; *D*, oblique suture passed, to rotate lower flap toward outer canthus; *E*, suture tied and skin triangle excised at outer canthus, and *F*, wound margins approximated in new relationship, lateral palpebral ligament being incorporated in suture at outer angle of wound.

Fig. 13.—Removal of eyelid pouches due to herniation of intraocular fat. *A*, skin incision made as in Figure 11*A* and dotted line indicates line of separation of fibers of orbicularis to expose tarso-orbital fascia; *B*, herniated fat removed, and *C*, margins of fascia approximated.

view (Fig. 13). The excess herniated fat is removed. In the excision only that portion which presents above the glistening white periosteum of the infraorbital margin is included. Care should be taken not to exert any undue pull on the fatty tissue, or the bright yellow intraorbital fat will prolapse into the wound. The resection of the fat hernia is facilitated by the use of smooth curved Kelly forceps; the mass is bisected and then dissected free from the center toward either end. Bleeding is controlled by fine absorbable surgical suture ligatures.

The margins of the ruptured fascia are imbricated and sutured with fine nonabsorbable surgical sutures. The redundant skin is then excised in the manner already described. To insure against a recurrence of the pouch, it is advisable that the undersurface of the skin flap be

attached to the tarsal cartilage with several sutures of fine white nonabsorbable surgical suture so that tarso-orbital adhesions may form. Finally, the skin margins are coapted with an interrupted or subcuticular suture of nonabsorbable surgical suture.

Upper-Eyelid Wrinkles (Fig. 14): Because of the scantiness of subcutaneous fat in the upper lid, wrinkles appear early in life in the form of numerous fine folds running parallel to the palpebral margin. As a rule they are less disturbing than those in the lower lid and require no treatment. Occasionally, however, the redundant skin hangs over the edge of the palpebral fissure or a tumor-like mass develops at the inner canthus as a result of a fat herniation through the thin tarso-orbital fascia. These deformities are at times so marked as to cause interference

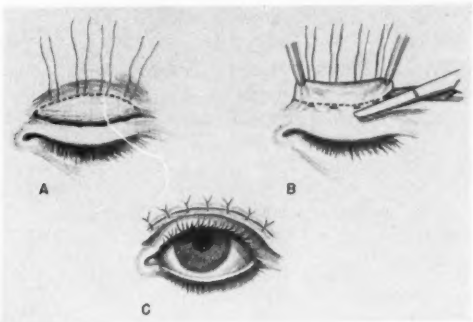

Fig. 14.—Removal of upper-eyelid pouches. *A*, skin to be removed outlined in methylene blue and basting sutures in place; *B*, basting sutures tied and resultant skin fold excised, and *C*, wound closed.

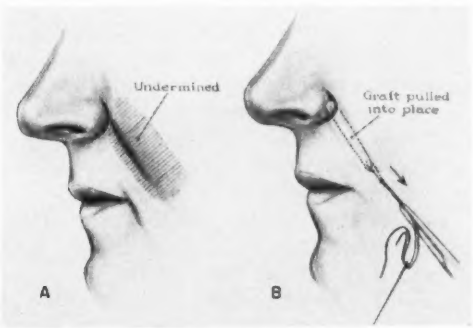

Fig. 15.—Eradication of nasolabial folds. *A*, skin undermined through incision along alar groove and *B*, dermal graft drawn into prepared bed with pilot suture.

with vision and require surgical removal. Correction is accomplished in the same manner as for similar disfigurements in the lower lid. The skin incision, however, instead of being placed near the lid margin, is so planned that the scar will lie in a natural fold. The results of these operations are excellent, and the danger of ectropion is slight. The amount of excess skin to be removed is marked out with methylene blue and fixed with basting sutures, which are adjusted to produce a mild ectropion. The excess skin is then removed, the herniated periorbital fat is excised, and the margins of the wound are united.

Nasolabial Folds (Fig. 15): Nasolabial folds can be eradicated by the following procedure, provided the grooves are not pronounced and the connective-tissue fibers not ruptured: An

incision 1 cm. long is made along the alar groove. A pair of blunt scissors is introduced into this opening, and the connective tissue adhesions are separated down to the angle of the mouth. The small wound at the alar groove is closed. The residual scar will be inconspicuous, being hidden in a natural fold.

In severe cases, in which the connective tissue bands are broken, the same method may be employed as for the eradication of glabellar wrinkles. Through the incision described above, the skin overlying the fold is elevated from the subjacent tissues, so as to form a pocket for the reception of a graft. A piece of dermal graft is cut into sections about 1 cm. square. These transplants are introduced into the prepared bed until the depression is leveled off. The original wound is then closed with one or two atraumatic sutures and a pressure dressing applied.

307 Second Ave. (3).

121 E. 60th St. (22).

555 Park Ave. (21).

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BACTERIOLOGIC AND EPIDEMIOLOGIC APPROACH TO THE TREATMENT OF SINORESPIRATORY INFECTIONS

Series II. Observations on Efficacy of Antibiotics with Continued Use

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IN A RECENT publication [1] two of us (S. J. P. and N. M.) presented a method for selecting the most suitable antibiotic in the treatment of respiratory infections. The method included growth of a culture as well as in vitro inhibition tests in order to determine specific antibiotic action. The need for this kind of bacteriological evaluation is becoming increasingly great in view of the fact that organisms resistant to the various antibiotics are becoming more noticeable. It has become apparent that clinical diagnosis only is often misleading as a basis for the choice of an antibiotic, and at times even bacteriological diagnosis made by culture and identification of the organism only is misleading. For these reasons our studies continue on in vitro inhibition, by the antibiotics in common use, of bacteria isolated from sinorespiratory infections. Furthermore, since the above-mentioned publication a new antibiotic of wide range, terramycin, has become available, and it was considered worth while to compare this antibiotic with the others previously tested.

It had been noted in the previous report that frequently there was a family incidence of chronic or recurrent respiratory infections and that this was possibly owing to the existence of a carrier within the family group. Emphasis was placed, therefore, in the present observations, on family groups, with incorporation of a larger series of families more completely studied than heretofore. Additional reasons for further pursuing these observations included an attempt to evaluate the continuous effectiveness of the antibiotics with the passing of time and to note whether or not the character of the bacterial flora had changed as a result of the widespread use of antibiotics and sulfonamides.

MATERIALS AND METHODS

The method of culture and in vitro inhibition testing has been described previously. Emphasis is placed upon simulating as closely as possible the condition found in the patient. Freshly obtained material for cultures from patients with sinorespiratory infections was taken in

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Dr. Prigal is from the Department of Medicine (Allergy), New York Medical College and Flower Hospital, and Dr. Molomut and Mr. Haber are from the Biological Laboratories.

1. Prigal, S. J., and Molomut, N.: Bacteriologic and Epidemiologic Approach to Treatment of Respiratory Infections with Antibiotic Aerosols, J. A. M. A. **144**:897 (Nov. 11) 1950.

dextrose-phosphate broth,[2] incubated for four hours (during lag phase of growth), and subcultured to differential mediums, blood plates and dextrose-phosphate broth, containing the various antibiotics. In this process it is important to obtain the organisms during the lag phase of growth; otherwise, overgrowth of one organism may suppress the others, thereby giving false information. The particular medium used for isolation was selected because it is a complete medium, in which the growth of fastidious organisms such as pneumococci and streptococci can be initiated from small inocula. Furthermore, this broth is free of complex infusion bases; therefore, the nutrient composition of each lot remains constant. In the performance of the inhibition tests no attempt is made to isolate each organism, but the group is taken as harvested and tested as a whole. This is done in consideration of the fact that organisms may differ in their behavior when isolated from a group in which symbiosis, antagonism, or other biological equilibria may be present.

Arbitrarily, we have selected 1 unit of penicillin, 10 units of bacitracin, and 10 γ respectively of streptomycin, aureomycin, and terramycin as the test doses for inhibition, since these are considered adequate and achievable dose levels obtainable in clinical practice. We have observed and recorded bacteriostatic action as manifested by complete, temporary and/or partial inhibition.

TABLE 1.—*Classification and Frequency of Occurrence of Each Organism Isolated*

Total Cultures—174	Total Organisms Isolated—332				
	Nose	Throat	Sputum	Eye	Total
Streptococci, nonhemolytic	4	24	4	0	32
Streptococci, beta hemolytic	2	56	9	1	68
Streptococci, alpha hemolytic	0	3	0	0	3
Hem. staphylococci	3	72	13	4	92
Nonhem. staphylococci (coagulase positive)	1	28	2	1	32
Nonhem. staphylococci (coagulase negative)	1	8	0	2	11
Diphtheroids	2	30	2	0	34
D. pneumoniae	0	5	1	0	6
Micrococci & tetragenous organisms	0	10	3	0	13
Diplococci (including N. catarrhalis)	0	11	1	0	12
P. vulgaris	1	9	2	0	12
B. subtilis	1	2	0	0	3
H. influenzae	0	8	1	0	9
B. pyocyaneus	0	3	1	0	4
B. cereus	0	0	0	1	1
Total	15	269	39	9	332

RESULTS

The present series includes 174 cultures from which were harvested 332 isolated organisms (Table 1). Of these, 15 were isolated from material from the nose, 269 from the pharynx, and 9 from the eye or eyelid. The material for the latter culture was taken whenever blepharoconjunctivitis was noted. As indicated in Table 1, in which is depicted the incidence of the organisms obtained in the present series, the organisms most frequently isolated were hemolytic staphylococci (92) and beta hemolytic streptococci (68). This incidence differs markedly from that of the original series wherein nonhemolytic streptococci and Neisseria catarrhalis were the organisms most frequently isolated. Other changes in the frequency were also noted, such as the sharp drop in the occurrence of Diplococcus pneumoniae. A comparison of the percentages of occurrence of the various organisms encountered in the first series covering the period of September, 1949, through May, 1950, and in the second series covering the period of June, 1950, through December, 1950, is shown in Chart 1.

2. Supplied by Albimi Laboratories, Brooklyn.

It is conceivable that the greater occurrence of hemolytic streptococci and staphylococci noted was owing to the selection of patients from whom material was obtained for culture because of our interest in the family group, and these organisms were much more frequently found in the families. It is also possible that as a result of the frequent use of antibiotics by most of the population and possibly as a result of the passage from person to person of resistant and pathological types of organisms, there has been a change in bacterial flora which is reflected in the flora of our patients. Seasonal variations in the flora may account in part for some of the differences noted between the earlier and later series. Thus, D. pneumoniae was infrequent in the second series which was continued through December, 1950. Our current data since January, 1951, show a higher incidence of D. pneumoniae. It is conceivable that the extensive use of antibiotics has resulted in either a variation of

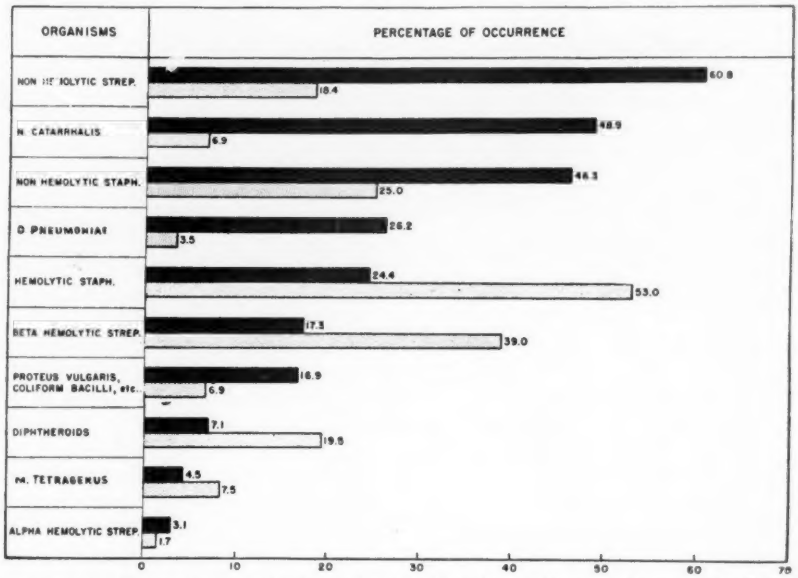

Chart 1.—Changes in bacterial flora. The solid black bars indicate data from Series I, 224 cultures from Sept. 1, 1949, to May 31, 1950. The shaded bars indicate data from Series II, 174 cultures from June 1, 1950, to Dec. 31, 1950.

bacteria to resistant forms or a process of selection which leaves a residue of resistant varieties of bacteria. It is important to emphasize this change in bacterial population since the previous observations were made because it may account for the difference in the activity of some of the antibiotics which previously have been recorded as highly effective.

In Table 2 is recorded the action of penicillin, streptomycin, bacitracin, aureomycin, and terramycin against 332 organisms isolated from 174 cultures. The actions of these antibiotics have been grouped into three categories—complete inhibition, no inhibition, and partial or temporary inhibition. The list of organisms not inhibited is important in view of the mistaken notion that certain species of bacteria

TABLE 2.—*A Comparison of the Inhibitory Action of Penicillin, Bacitracin, Streptomycin, Aureomycin, and Terramycin Against 332 Organisms Isolated from 174 Cultures*

	Streptococci			Staphylococci		Diphtheroids	D. Pneumoniae	Micrococci and Tetragenous Organisms	H. Influenzae	Diplococci and N. Catarrhalis	P. Vulgaris	B. Subtilis	B. Pyocyaneus	B. Cereus	Total All Organisms	% of Total Isolated
	A	B	O	Hem.	Nonhem.											
Inhibited																
Penicillin	2	35	20	48	23	26	4	8	7	10	1	1	0	0	185	56
Streptomycin	1	20	11	29	12	17	4	8	1	5	6	1	1	0	116	35
Bacitracin	0	25	19	47	17	18	4	8	4	6	3	2	0	1	154	48.5
Aureomycin	1	33	7	30	11	15	2	3	9	6	1	2	0	0	120	36
Terramycin	3	47	30	61	30	28	6	8	9	9	8	1	1	1	242	73
Not inhibited																
Penicillin	1	24	9	33	13	6	2	5	1	3	8	2	3	1	111	34.5
Streptomycin	2	44	23	60	26	16	2	5	8	8	5	2	2	1	204	61.5
Bacitracin	1	33	12	29	17	15	2	4	5	5	8	1	2	0	134	40
Aureomycin	2	29	25	52	29	16	3	10	0	7	10	..	4	1	186	56
Terramycin	0	9	3	12	7	4	0	1	0	0	3	..	3	0	44	13
Partial or temporary inhibition																
Penicillin	0	6	6	9	4	1	0	0	0	0	3	0	0	0	29	9.5
Streptomycin	0	1	1	7	4	0	0	0	0	0	1	0	1	0	15	4.5
Bacitracin	2	7	4	14	6	1	0	0	0	2	1	0	1	0	38	11.5
Aureomycin	0	3	3	8	2	2	1	0	0	0	1	0	0	0	20	6
Terramycin	0	4	2	13	5	1	0	0	0	0	1	0	0	0	26	7.8

are inherently sensitive to specific antibiotics. Partial inhibition in which there is sparse growth indicates that the antibiotic is exerting some, but apparently not complete, inhibition. In the case of temporary inhibition, as previously reported, we have noted that no growth occurred during the six- to eight-hour interval but during the 18- to 24-hour interval growth was grossly in evidence and equivalent to the growth of the control. It is important to note this phenomenon, since it seems to occur in patients who are chronically ill and whom it has been exceedingly difficult to treat in the past. It would also indicate that a more vigorous therapeutic approach will have to be applied in these cases, in which larger doses of antibiotics are given more frequently or in which combinations of antibiotics are employed.

An attempt has been made in evaluating the action of the antibiotics to enumerate the specific action of each antibiotic against specific categories of bacteria. As will be noted in Table 2, antibiotics frequently react against a variety of organisms in a manner not anticipated. In comparing the action of the antibiotics, it is evident that in the present series terramycin shows the greatest over-all bacteriostatic action against 73% of the total organisms isolated. Penicillin was second in order, affecting 56%; bacitracin affected 48.5%, aureomycin 36%, and streptomycin 35%. Compared with the previous report, this indicates a marked drop in the apparent efficiency of aureomycin, which fell from 80%. Likewise, bacitracin has been reduced from 82% efficiency to 48.5%. Penicillin and streptomycin have also fallen in efficiency (penicillin from 73% to 56%, streptomycin from 72% to 35%). Although streptomycin efficiency ranks a low 35%, a glance at the chart reveals how important it may be in the treatment of certain infections, particularly of staphylococci in which it was revealed to be potent at times when none of the other antibiotics showed any activity.

A glance at the distribution of bacteria falling within the range of the noninhibited group reveals some significant data. It is noted, for example, that penicillin does not act against 25 hemolytic streptococci, 33 hemolytic staphylococci, and 2 strains of D. pneumoniae. Bacitracin was ineffective against 34 hemolytic streptococci and 2 strains of D. pneumoniae. Streptomycin failed to inhibit eight strains of Hemophilus influenzae and five strains of Proteus vulgaris. A check of the aureomycin activity reveals 31 hemolytic streptococci and 52 hemolytic staphylococci and 3 strains of D. pneumoniae insensitive to this antibiotic. Terramycin in the same concentration failed to inhibit 9 hemolytic streptococci and 12 hemolytic staphylococci. There were no strains of D. pneumoniae which were not affected by terramycin in contrast to the other antibiotics. The antibacterial action of the antibiotics discussed above was deliberately mentioned out of context because of reports which indicate that these antibiotics are particularly effective against these species of organisms. The data point again to the fallacy of resorting to the use of an antibiotic primarily on the basis of the identification of an organism and/or a clinical impression.

Further analysis of the section of Table 2 concerning partial or temporary inhibition disclosed that this phenomenon is noted with all antibiotics, although oftenest with bacitracin, and is evident primarily in staphylococci (51 hemolytic), streptococci (23 hemolytic), P. vulgaris (7), and D. pneumoniae (1).

Chart 2 portrays the incidence (percentage of occurrence) of the species of bacteria encountered (numbered columns) and the efficiency of the various antibiotics (solid black bars) against each of the species. Thus, it is noted that hemo-

lytic staphylococci occurred with an incidence of 53% and that the most efficient antibiotic for this organism was bacitracin, closely followed by terramycin—each of these antibiotics being effective against more than 50% of these organisms. Penicillin was effective in only 50% of the hemolytic staphylococci and aureomycin and streptomycin in approximately 30% of this group. Hemolytic streptococci occurred with a frequency of 39%, and the best antibiotic was terramycin, with penicillin and aureomycin not far behind.

Other significant findings recorded in Chart 2 reveal that aureomycin and terramycin inhibited all H. influenzae encountered and were considerably better than streptomycin for treatment of this organism, as were also penicillin and bacitracin.

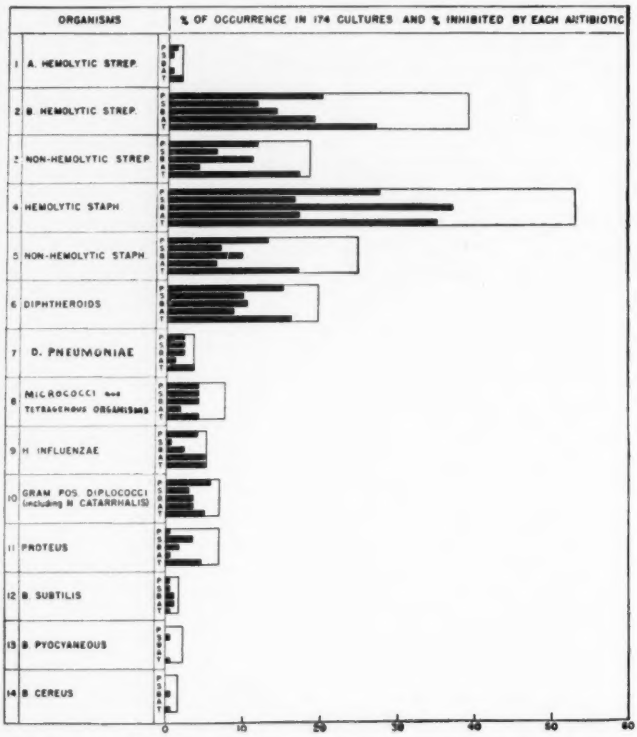

Chart 2.—Limited action of the antibiotics against organisms isolated from sinorespiratory infections. The white bars indicate the percentage of occurrence and the black bars the percentage of inhibition, P, S, B, A, and T stand for the antibiotics penicillin, streptomycin, bacitracin, aureomycin, and terramycin, respectively.

The D. pneumoniae, relatively infrequent in this series, were all inhibited by terramycin. Penicillin, streptomycin, and bacitracin were equal but less efficient, and aureomycin was effective in less than 50% of the D. pneumoniae encountered.

A most significant factor depicted by Chart 2 is the relatively large number of organisms (approximately 50%) unaffected by antibiotic action. In Column 2, for example (beta hemolytic streptococci), the total occurrence of the organism is

TABLE 3.—*A Comparison of the Exclusive Action of Penicillin, Bacitracin, Streptomycin, Aureomycin, and Terramycin Against 332 Organisms Isolated from 174 Cultures*

	Streptococci			Staphylococci		Diphtheroids	D. Pneumoniae	Micrococci and Tetragenous Organisms	H. Influenzae	Diplococci and N. Catarrhalis	Proteus and Gram-Neg. Bac.	B. Subtilis	B. Pyocyaneus	B. Cereus	Total and % of All Organisms
	A	B	O	Hem.	Nonhem.										
Penicillin only	0	0	0	2	1	1	0	0	0	0	0	0	0	0	4 (1.2%)
Bacitracin only	0	2	1	6	2	0	0	0	0	0	1	0	0	0	12 (3.6%)
Streptomycin only	0	2	1	3	0	0	0	2	1	1	1	0	1	0	11 (3.3%)
Aureomycin only	0	1	0	1	0	0	0	0	0	0	0	1	0	0	3 (0.9%)
Terramycin only	0	4	2	6	2	2	0	1	0	0	3	0	1	0	21 (6.4%)
Not inhibited by any of above	0	2	0	4	4	0	0	0	0	0	1	0	2	0	13 (3.9%)

expressed by the area occupied by the entire column. The inhibitory action of each antibiotic is depicted by a narrow black bar. The sum total area of inhibition is, therefore, expressed by the total area shaded black, the residual unshaded area indicating noninhibition and partial or incomplete inhibition. In the case of hemolytic staphylococci, the dominant organism encountered, inhibition, which occurred 215 times, was outnumbered by the combination (237) of no inhibition (186 times) and partial or temporary inhibition (51 times) (Table 2). In the case of Bacillus pyocyaneus (Column 13) the unshaded area far exceeds the shaded area, indicating that only a minority of this group were affected by antibiotic action. The implication of these observations is that the random choice of one or more of the five antibiotics investigated for action against infection, as we have encountered them, would at best lead to approximately 50% therapeutic efficiency, provided the host factor ("immunity") and self-limiting factors of the disease were not considered. This speaks again for in vitro inhibition testing in view of the limited and exclusive action of the antibiotics.

In further evaluating the antibiotics, an attempt was made to determine the exclusive action of each of the antibiotics. The findings are recorded in Table 3. We note that there were 51 organisms in which only one antibiotic was effective in the concentration employed. Half of these organisms were hemolytic streptococci and staphylococci. Table 3 not only lists the antibiotic and the frequency with which it showed exclusive inhibitory action but also tells against which organism the inhibitory action was shown. Terramycin showed the highest exclusive action against 21 organisms (6.4%). All the antibiotics, however, showed exclusive action, although to a less degree than did terramycin. Thus, streptomycin and bacitracin acted against 11 and 12 organisms (3.3% and 3.6%), respectively. Aureomycin and penicillin showed exclusive action against only three and four organisms respectively. It is of special interest, again, that streptomycin showed exclusive action against two hemolytic streptococci and three hemolytic staphylococci. Also listed in Table 3 are the organisms found to be completely insensitive to any of the antibiotics tested at their respective strengths, and it is noted that 13 organisms (3.9%) were completely insensitive to any of the antibiotics tested. (It is interesting to note that this approximates in magnitude the exclusive action of the antibiotics, terramycin excepted.) A comparison of the present number of insensitive organisms with the number previously reported, for which the incidence was 1.8% (terramycin not included), indicated that we are constantly encountering more resistant strains with the passage of time. Analysis of the organisms in the uninhibited group reveals that two isolated strains of hemolytic streptococci, four of hemolytic staphylococci, four of nonhemolytic staphylococci, one of P. vulgaris, and two of B. pyocyaneus are included. Once again, we note the urgent need for additional agents to overcome the more resistant strains as they are encountered.

In the epidemiological studies, 22 families were investigated, in 17 of which evidence was encountered of contagion and/or the carrier state. This report, the second in the series, is more representative of the family, and there are instances in which families of four or five members were investigated. In the families studied completely, 11 of 12 showed evidence strongly suggestive of contagion, whereas in incomplete family groups, 6 of 10 showed such possible contagion. In some of the families, as recorded in Table 4, three of five members of the same family had identical organisms; not always only a single organism but at times even two or

On the ninth hospital day a new ulceration developed on the left anterior tonsillar pillar. Cortisone therapy was again given for four successive days, 300 mg., 200 mg., 200 mg., and 100 mg. respectively. On the 17th hospital day, eight days after the ulcer was noted, it had healed.

On the 22d hospital day, another new ulcer was noted on the right arytenoid cartilage. Cortisone was again given for four successive days in the following doses: 300 mg., 200 mg., 200 mg., and 100 mg. On the seventh day following the appearance of the ulcer it had healed. In a 29-day period, this patient received a total of 2.1 gm. of cortisone, but no effects were noted on the onset and duration of the symptoms of Behcet's syndrome.

In the past two months similar lesions have developed and with no treatment have healed in from 7 to 10 days.

COMMENT

This case is reported to illustrate a serious otolaryngological complication of Behcet's syndrome. Medical literature contains reports of fibrosis following acute attacks of this disease; however, there are no reports of a subsequent fibrotic process similar to that in this case. Apparently, by the time this patient entered the hospital he had had many attacks with subsequent fibrosis, so that the laryngeal stenosis produced a markedly narrowed airway. When the edema, injection, and ulcerations of an acute attack were superimposed on the barely adequate airway, it became completely obliterated and a tracheostomy was necessary. At the time of this writing, between attacks, the glottic airway was just adequate; however, any small ulceration with the accompanying edema shut off the airway and the only alternative was a tracheostomy. The condition, although considered benign, certainly is progressive in the case reported here. It is very likely that repeated attacks will cause the glottic chink to close off completely, and then the only alternative will be a permanent tracheal stoma. To date all forms of treatment have been unsuccessful. Since the healing of the ulcerations of the pharynx, larynx, and genitalia has always been followed by considerable fibrosis, the patient was given a course of cortisone during his last acute attack in the hope that further extensive ulceration and fibrosis would be aborted or diminished in extent. A total of 2.1 gm. of cortisone was given and did not appear to influence the course of the disease in any respect.

SUMMARY

An interesting case of Behcet's syndrome in a white man aged 26, complicated by laryngeal obstruction requiring repeated temporary tracheostomies, is reported. Treatment with cortisone failed to show a favorable effect.

1950 Andrews Ave.

SPONTANEOUS INTRAMAXILLARY HEMORRHAGE

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THE RARITY of spontaneous hemorrhage from within the maxillary sinus is revealed upon a search of the available literature, in which 23 such instances have been reported. The first was reported by Bass [1] in 1927. He later combined the report of this first case with three others in 1936.[2] In all these cases there was unilateral epistaxis with blood coming from the middle meatus and the involved sinuses were dark on transillumination and opaque on roentgentologic examination. Puncture and lavage yielded fresh and old clotted blood. In two cases Caldwell-Luc operations were performed, and revealed degenerated polypoid membrane. In the other two cases control was accomplished by repeated irrigations followed by the topical instillation of brain extract (thromboplastin local®). In three cases the patients were men and in one the patient was a woman. The left sinus was involved in three and the right in one. The serologic tests for syphilis were negative in all instances, and the only remark concerning the blood picture was that there was a slight or moderate degree of hypochromic anemia present. No histopathological reports were given.

Bass included in his article a summary of five cases reported in 1929 by Trible.[3] In three of these cases the origin was dental, secondary to openings accidentally made into the sinus at the time of extraction of a tooth or retained root fragments. Another case concerned a 12-year-old boy with sarcoma of the liver, in which no further information was given. The fifth case was probably a true case of spontaneous intramaxillary hemorrhage. This hemorrhage occurred in a 64-year-old woman; however, essential data were not given.

Hall and Thomas [4] in 1938 presented a masterful treatise on the subject and reported 12 cases of their own. There were seven men and five women ranging in age from 31 to 66. The right antrum was the site of bleeding in five and the left in seven. There was no history of direct or indirect trauma. The patients reported the typical history of sudden, profuse epistaxis for no apparent reason which stopped spontaneously only to recur in a short time. In all cases the serologic tests for

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Read before a meeting of the College of Physicians of Philadelphia, Section on Otolaryngology, Philadelphia, April 18, 1951.

1. Bass, A. L.: Acute Mastoiditis, Bilateral, in Infant 6 Months Old, Weighing 8 Pounds, 6½ Ounces: Hemorrhage from the Antrum of Highmore; Case Reports, Kentucky M. J. **25**:552 (Oct.) 1927.

2. Bass, A. L.: Primary Hemorrhage from the Antrum Highmore, South. M. J. **29**:815 (Aug.) 1936.

3. Trible, G. B.: Epistaxis of Antral Origin: Report of Cases, Arch. Otolaryng. **10**:633 (Dec.) 1929.

4. Hall, S. S., and Thomas, H. V.: Spontaneous Hemorrhage into the Maxillary Sinus, Arch. Otolaryng. **28**:371 (Sept.) 1938.

syphilis were negative, and there was no evidence of any abnormality in the blood clotting mechanism. Roentgenologic examination showed opacity of the sinuses in all the patients, and lavage yielded significant results by the return of old and clotted blood. Ten of the 12 patients were operated on by the Caldwell-Luc procedure, and gross and microscopic hyperplastic mucosa was disclosed. Hall and Thomas concluded that spontaneous intramaxillary hemorrhage does occur as a complication of hyperplastic maxillary sinusitis and that in the future they would probably handle such conditions by repeated lavage instead of immediate performance of a Caldwell-Luc operation, providing a patient's general condition did not warrant immediate surgical intervention.

Since this very excellent presentation by Hall and Thomas, only two additional references could be found. One of these, by Vreeland [5] in 1941, was very incomplete. The other, by Diaz [6] in 1946, was a report of a 19-year-old youth with what undoubtedly was a true spontaneous intramaxillary hemorrhage. Of the present-day textbooks,[7] only two contain slight reference to the possible existence of this entity, and they shed little, if any, light on the subject.

My attention was attracted to this condition in November, 1947, when a 68-year-old man came to me because of severe epistaxis from the right side of the nose. He had been seen elsewhere in 1944 because of a hemorrhage from the right side necessitating anterior and posterior nasal packing, but no site of bleeding was found. In March, 1947, he had bled from the right side of the septum in its midportion. In November, 1947, he had intermittent episodes of bleeding from the right side, but each episode had stopped as spontaneously as it had started. Blood could be seen in the right middle meatus, which was the only possible source of epistaxis, and the maxillary sinus was seen to be black on transillumination and opaque on roentgenologic examination. A puncture and lavage yielded old, clotted blood. Iodized oil (lipiodol®) instillation revealed a thickened, hypertrophied membrane. There was no evidence of any blood dyscrasia, and the serologic tests for syphilis were negative. A Caldwell-Luc operation was done, and chronic hyperplastic sinusitis was seen clinically and histologically with marked submucosal hemorrhage.

Since this first patient, five additional ones have been seen and cared for. All six patients were men aged 68, 61, 41, 31, 21, and 69 respectively. The bleeding occurred on the left in two and on the right in four. The history was typical in all, with sudden, profuse, unilateral hemorrhage. This started spontaneously in all cases, associated with very little exertion. Activities such as bending forward to tie a shoe or pushing a small cart loaded with electrical appliances were typical exertions. The bleeding stopped spontaneously after the patients had lost varying amounts of blood only to start again in a few moments, hours, or days. There were no other symptoms or sensations of which the patients complained. In no case was there any kind of trauma, direct or indirect, to the face, maxillary area, or teeth.

Usually some one called for the patient during a recurrence of the bleeding. The attendant stated that the other attacks had stopped shortly but this one did not seem

5. Vreeland, R. J.: Nasal Hemorrhage Originating in the Maxillary Sinus, J. M. Soc. New Jersey **38**:473 (Sept.) 1941.

6. Diaz, E. R.: Epistaxis of Sinus Origin, J. Laryng. & Otol. **61**:266 (May) 1946.

7. Wolf, G. D.: Ear, Nose, and Throat, Philadelphia, J. B. Lippincott Company, 1947. Imperatori, C. J., and Burman, H. J.: Diseases of the Nose and Throat, ed. 3, Philadelphia, J. B. Lippincott Company, 1947.

to be stopping. By the time the patient had reached the office or the hospital the bleeding had stopped temporarily only to start again shortly after the patient was seen. The nose was cleansed of all blood clots with suction and hemorrhage at the usual sites sought for but not found. The next step was to transilluminate the sinuses, and invariably the maxillary sinus on the involved side was found to be dark while the other one was clear, or almost so. The interior of the nose was then anesthetized and examined thoroughly with a nasopharyngoscope. In every case blood could be seen in the region of the normal ostium, and in some the ostium could be seen to contain a clot. At no time was any abnormal tissue seen in the middle meatus. No accessory maxillary ostia were seen.

In no case was there any evidence of abnormality of the coagulating properties of the blood. The complete blood cell count was normal, except for a slight to moderate reduction of the hemoglobin and red cells. Bleeding and coagulation times were normal. The platelet count was within normal limits. In each case the prothrombin time was normal and the serologic test for syphilis was negative.

In five of the six patients roentgenograms of the sinuses revealed evidence of thickened, hypertrophied membrane or a diffuse haziness overlying the involved sinus. Puncture and lavage of the maxillary sinus was performed in all the patients, and all yielded old blood in clots. The irrigation was followed immediately by the instillation of iodized oil and the sinuses reexamined roentgenologically. In four of the patients hypertrophied, irregular lining membrane was demonstrated, and one patient showed a solitary polyp. In two patients there was no demonstrable abnormality of the membrane and no filling defect.

The last two patients were not operated on, or have they had recurrence of the bleeding in 34 months and 6 months, respectively. However, the four patients who did show pathological interiors of the sinus had Caldwell-Luc operations. On operation, hyperplastic, polypoid membrane was found whose thickness varied from one-fourth to one-half inch (0.6 to 1.3 cm.). A solitary polyp was found in one patient situated where the iodized oil had demonstrated it to be. In only one was the bleeding point thought to be seen; it was located at the margin of a markedly hypertrophied area. The entire lining membrane was removed from each antrum and examined histologically. The pathologist's report of the first patient is typical of all four; it stated that the section showed numerous fragments of tissue covered on one surface by pseudostratified columnar epithelium which was often ciliated. The stroma was markedly hemorrhagic and moderately edematous. There were mild fibrosis and frequent aggregations of all types of inflammatory cells, the neutrophiles predominating in some areas and the mononuclears in others. As indicated above, hemorrhage was the predominant feature.

Convalescence was uninterrupted in all but one patient in whom some granulation tissue developed at the posterior margin of the antrotomy, from which area there was mild bleeding. One patient died seven months after his operation at the age of 41 of a coronary occlusion.

It is impossible to define the etiology of this entity with the exception of proved preexisting hyperplastic sinusitis in the four patients on whom operations were performed. Of these four, two had hypertension, and a third had terrible dental caries and the roots of the upper left second molar had caused chronic inflammation of the lining membrane with focal necrosis. Of the two patients who had hemorrhages but did not have surgery, one had hypertension while the other one did not.

The roentgenograms showed the interior of each involved maxillary sinus in detail. In the first patient, routine roentgenograms showed a diffuse density overlying the right maxillary sinus. The iodized oil demonstrated marked abnormality of the lining membrane. In the second patient no abnormality was revealed in routine roentgenograms or on iodized oil instillation. This patient was not operated on, since no defect was shown. In the third patient, a density could be seen over the right maxillary sinus and the iodized oil showed a thickening along the floor and lateral wall. The fourth patient was the patient with marked dental caries. Routine roentgenograms showed clouding of the left maxillary sinus, and the iodized oil showed considerable thickening of the lining membrane. Roentgenograms of the fifth patient revealed a homogeneous density over the left maxillary sinus, but contrast medium studies failed to show any filling defect. I am sure that the lateral wall area appeared as thickened membrane because of an adherent blood clot, but this was washed off on irrigation and the iodized oil filled the sinus completely. The last patient showed a mild density over the right sinus, while the iodized oil revealed a distinct rounded mass the location of which was confirmed at operation to be in the region of the anterior portion of the inferior meatus wall, from which site the bleeding certainly must have occurred.

REPORT OF CASES

CASE 1.—Mr. A. A., aged 68, had severe epistaxis on March 21, 1947, and the source was seen to be in the midportion of the septum on the right side. The epistaxis was easily controlled. All the sinus areas were seen to be clear on transillumination. Blood pressure was within normal limits. The urine was normal. There was slight secondary anemia with normal coagulation and bleeding times, the platelet count was 110,000, and the prothrombin time was 80% of normal. Within four days the platelet count rose to 392,000 and the prothrombin time to 100% of normal.

On Nov. 6, 1947, he was readmitted tto the hospital because of severe epistaxis from the right side. A thorough search of the nasal fossae revealed no source of bleeding. The bleeding had stopped and started spontaneously on several occasions during his first 12 hours in the hospital with no exertion on the patient's part. Finally a large blood clot was removed from the middle meatus, and by using the nasopharyngoscope one could see active bleeding from the right normal maxillary ostium. The urine again was normal. The blood count was quite good, with normal coagulation and bleeding times. The platelet count was 129,000 and the prothrombin time 100% of normal. On transillumination the right maxillary sinus was seen to be black, while both frontal sinuses and the left maxillary areas were clear. Roentgenograms of the sinuses revealed an abnormal density over the right ethmoid and maxillary areas, while the remaining sinuses were normal. Puncture and lavage yielded a large amount of old blood in clots, and iodized oil instillation revealed extensive thickening of the membrane with irregular borders. A Caldwell-Luc operation was performed, and the lining membrane was found to be markedly thickened and a large bleeding vessel was seen in the posterolateral and inferior portion of the sinus. A histological report on the membrane revealed hyperplasia with moderate fibrosis, and the predominating feature was submucosal hemorrhage. The patient's convalescence was interrupted by slight but easily controlled bleeding from some granulation tissue at the posterior margin of the antrotomy.

CASE 2.—Mr. S. S., aged 61, was admitted to the hospital on June 20, 1948. Six years before he had a bowel resection because of a malignant growth. His recovery was apparently complete. On two occasions in the two weeks preceding admission he had a massive hematuria. He had epistaxis on the right side the night before admission, which started and stopped spontaneously. On transillumination the right maxillary area was seen to be black. The other areas were normal. Inspection of the nasal fossae revealed no source of bleeding, but with a nasopharyngoscope one could see blood in the region of the normal ostium. Urinalysis revealed a trace of albumin. The results of blood studies were all normal, including coagulation and

bleeding times. The platelet count was 202,000, and the prothrombin time was 100% of normal. Sinus roentgenograms showed the sinuses to be normal. Puncture and lavage of the right maxillary sinus revealed a large amount of old blood in clots. Iodized oil was instilled, and the roentgenograms again revealed no abnormality of the lining membrane. Urologic studies of the kidney and bladder failed to reveal a source of hematuria. There has been no recurrence.

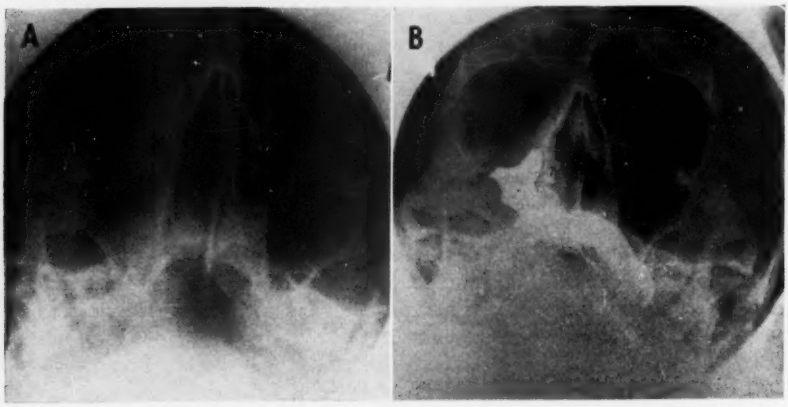

Fig. 1.—*A*, routine roentgenogram of sinuses; *B*, after instillation of iodized oil.

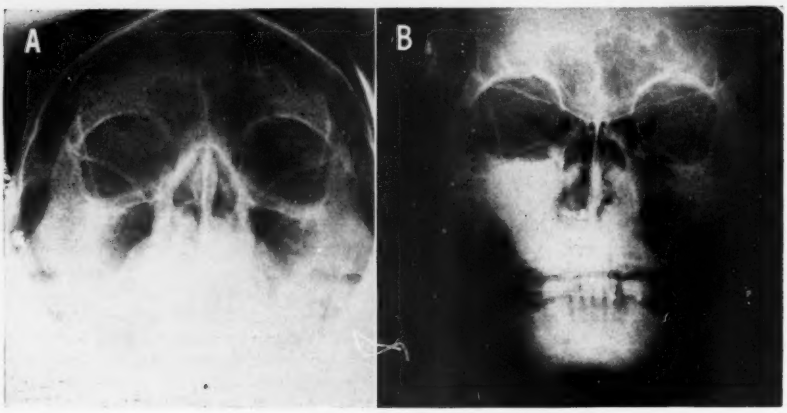

Fig. 2.—*A*, routine roentgenogram of sinuses; *B*, after instillation of iodized oil.

Since there was no demonstrable lesion and no recurrence of bleeding the patient was discharged without surgery, and to date there has been no recurrence of epistaxis.

Case 3.—Mr. H. R., aged 41, was admitted to the hospital on Nov. 18, 1948, because of severe epistaxis from the right side. He had had recurrent bleeding which started and stopped spontaneously. A thorough search of the interior of the nose did not reveal any source of bleeding until the nasopharyngoscope revealed a blood clot in the region of the right maxillary ostium. The right sinus was seen to be black on transillumination, while the others were normal. The results of urinalysis were normal. The blood cell count was within normal limits,

and the results of all blood studies were normal, including coagulation and bleeding times, platelet count of 235,000, and prothrombin time 100% of normal. Sinus roentgenograms revealed a density over the right maxillary sinus, while the other sinuses were normal. A puncture and lavage yielded a large amount of old blood in clots. Iodized oil was instilled, and roentgenograms revealed a markedly thickened, irregular membrane lining the sinus. A Caldwell-Luc operation was performed, and thickened membrane was found throughout the sinus but was most marked in the anterior medial portion. The histological report revealed a fibromyxomatous polyp of the right maxillary sinus with a picture of predominating submucosal hemorrhage. The patient's convalescence was uninterrupted. He was known to have hypertension; however, during his hospital stay, his blood pressure reached 140/80 at the highest. He died suddenly on June 28, 1949, seven months after his operation, of an acute coronary occlusion.

CASE 4.—Mr. J. S., aged 31, was admitted to the hospital on March 1, 1950, because of severe epistaxis on the left side. He had had intermittent epistaxis one week previously. It was never severe and started and stopped spontaneously. Exertion of any kind caused bleeding. A thorough search of the left nasal fossa failed to reveal any source of bleeding. The left maxillary area was black on transillumination, while the other areas were normal. A blood

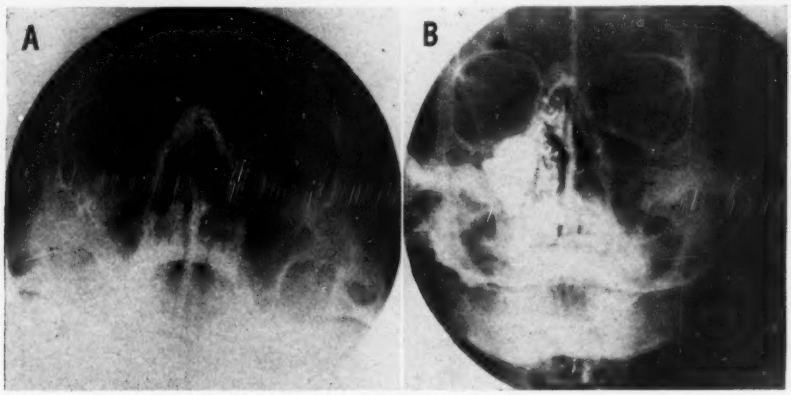

Fig. 3.—*A*, routine roentgenogram of sinuses; *B*, after instillation of iodized oil.

clot and bleeding could be seen in the region of the left normal ostium with the nasopharyngoscope. The teeth were nothing but roots and snags. The blood pressure was within normal limits. The blood cell count was normal. Coagulation and bleeding times were normal. The platelet count was 163,000, and the prothrombin time was 100% of normal. Roentgenograms of the sinuses revealed clouding of the ethmoid and maxillary areas bilaterally but much more marked on the left side. A puncture and lavage yielded a large amount of old blood in clots. Iodized oil was instilled, and the roentgenograms showed considerable thickening of the lining membrane. A Caldwell-Luc operation was performed but was preceded by extraction of the tooth roots of the last molar which apparently communicated with the floor of the sinus. The lining membrane of the sinus was markedly thickened and hemorrhagic, and the tooth area could definitely be seen and probed. The histological report revealed a chronic inflamed membrane with hemorrhage scattered throughout the stroma. The patient's convalescence was uninterrupted, and to date there has been no recurrence of any epistaxis.

CASE 5.—Mr. F. D., aged 69, was admitted to the hospital on Nov. 12, 1950, because of severe epistaxis from the left side. He had been known to have hypertension for years with considerable myocardial change. For three or four months prior to his admission he had had frequent sudden episodes of bleeding from the left side of the nose only. There was never a large quantity of blood, and the bleeding always stopped spontaneously. On the day of admission the bleeding did not stop. Examination showed no source of bleeding in the nasal fossa until

the nasopharyngoscope revealed a blood clot in the region of the left normal ostium and the left maxillary area was seen to be black on transillumination while the other areas were normal. The results of urinalysis were normal, the blood cell count was normal, and coagulation and bleeding times were normal. The platelet count was 144,000, and the prothrombin time was 100% of normal. Roentgenograms revealed normal sinuses except for a homogenous density over the left maxillary sinus. A puncture and lavage yielded a large amount of old blood.

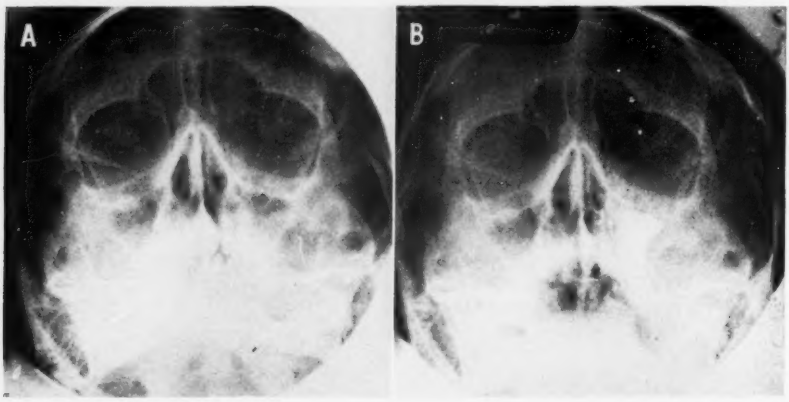

Fig. 4.—*A*, routine roentgenogram of sinuses; *B*, after instillation of iodized oil.

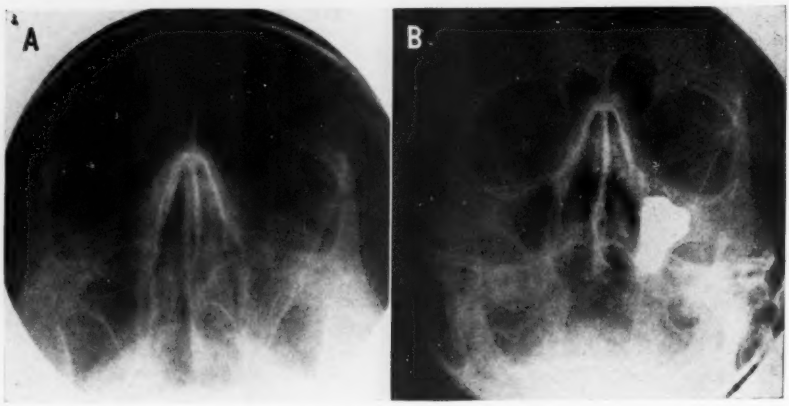

Fig. 5.—*A*, routine roentgenogram of sinuses; *B*, after instillation of iodized oil.

Iodized oil was instilled, and it did not show any gross abnormality in the lining membrane. There was no recurrence of bleeding. An electrocardiogram showed considerable myocardial change due to hypertension. Surgery was not recommended. There has been no recurrence of epistaxis to date.

Case 6.—Mr. G. C., aged 22, was admitted to the hospital on Nov. 10, 1950, because of severe epistaxis from the right side. This occurred for the first time early in the morning of the same day, while dressing. By noon it had started and stopped spontaneously several times. Examination did not reveal any source within the fossa until a blood clot and bleeding

were seen to be coming from the normal maxillary ostium. On transillumination the right maxillary area was seen to be black while the remaining areas were normal. The results of urinalysis were normal, and the blood cell count was normal. Coagulation and bleeding times were normal. The platelet count was 171,000, and the prothrombin time was 94% of normal. Sinus roentgenograms revealed a homogenous density over the right maxillary sinus while the others were normal. A puncture and lavage of the right maxillary sinus yielded much old blood in clots, and iodized oil showed a solitary polyp-like mass in the anterior medial wall area. A Caldwell-Luc operation was performed, and the membrane throughout was found to be slightly thickened but the region of the anterior portion of the medial wall was markedly thickened and polypoid. No definitely bleeding vessel was seen. The histological report revealed a chronic hyperplastic membrane with many focal areas of hemorrhage. The patient's convalescence was uninterrupted.

CONCLUSIONS

1. Review of all available literature revealed 23 reported cases of intramaxillary hemorrhage to which herewith have been added six more, entirely "spontaneous" in origin.

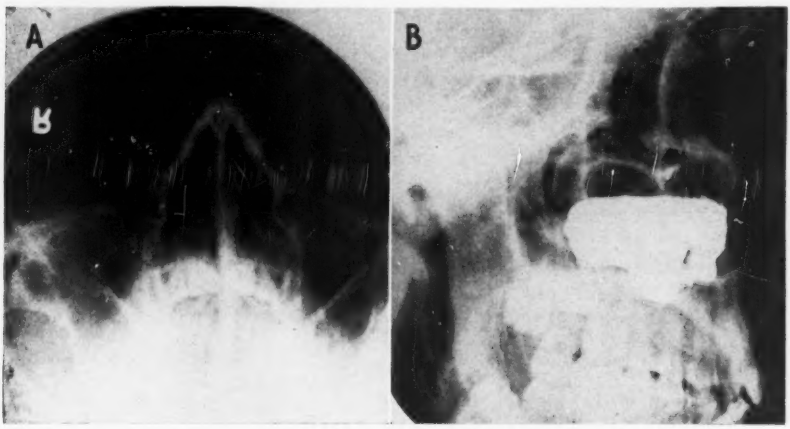

Fig. 6.—*A*, routine roentgenogram of sinuses; *B*, after instillation of iodized oil.

2. Spontaneous intramaxillary hemorrhage does occur as a complication of chronic hyperplastic maxillary sinusitis. It also can be associated with changes of the lining membrane secondary to marked dental inflammatory disease. Hemorrhage from the maxillary sinus subsequent to dental manipulations (extractions, etc.) should not be considered "spontaneous."

3. It is possible to demonstrate positively that the hemorrhage originates within the maxillary sinus by competently examining the entire interior of the nose and finding no bleeding site other than the normal ostium area; this is further confirmed to be the only site by the obtaining of old, clotted blood on puncture and lavage of the sinus.

4. Contrast-medium studies should be done for every patient with intramaxillary hemorrhage. If these reveal an abnormal lining membrane, a Caldwell-Luc operation should be performed to remove the site of bleeding.

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TRUE CHOLESTEATOMA OF THE TEMPORAL BONE

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CHOLESTEATOMAS may be defined as globular masses composed of horny and desquamated epidermis and occasional cholesterol crystals surrounded by a thin shell of epidermis and connective tissue.[1] While cholesteatomas do occur in other parts of the body, such as the calvaria,[2] base of the brain, cerebellopontile angle, ventricles, choroid plexuses, and spinal column, the incidence in the middle ear and temporal bone is much greater. The rarity of cholesteatomas in other areas is attributed to the absence of statified, squamous epithelium. Moreover, it is assumed, in other instances, that their development stems from epithelial remnants deposited during embryonic life in some accident in the course of development. In these rare conditions the masses are called true cholesteatomas, in contradistinction to the cholesteatomas of the middle ear and temporal bone, which are of greater incidence and are termed pseudocholesteatomas. The latter, as will be brought out in the discussion of their pathogenesis, may be regarded as either primary or secondary. We would like to review some of the accepted theories of the pathogenesis of cholesteatomas and to present a case of an immense, true cholesteatoma of the temporal bone.

PATHOGENESIS

Although the pathogenesis of cholesteatoma formation is still not fully understood, it is generally accepted that true cholesteatomas develop from epithelial remnants deposited as a result of some developmental error in the course of embryonic life. This simple explanation is, however, in conflict with the various theories advanced to explain the development of pseudocholesteatomas, which are observed in the middle ear and temporal bone. For example, many clinical investigators, as a result of their observations of cholesteatomatous formations of the middle ear and temporal bone (invariably associated with chronic and recurrent aural discharge and marginal perforations of the pars tensa or flaccida) have come to the conclusion that these cholesteatomas are directly due to and secondary to the irritative and inflammatory conditions of the middle ear. Their clinical beliefs were strengthened

From the Illinois Eye and Ear Infirmary, of the University of Illinois College of Medicine.

1. Lederer, F. L.: Diseases of the Ear, Nose and Throat, ed. 5, Philadelphia, F. A. Davis Company, 1946.

2. Erdheim, J.: Über Schädelcholesteatome, Ztschr. Ohrenh. **49**:281, 1905. Erdheim observed that cholesteatomas of the skull have the characteristic in common of occurring at the site where the temporal, parietal, and occipital bones meet. He also recognized that the inner surface of the skull, i. e., the tabula vitrea, tends to become more involved and absorbed than does the tabula externa.

by the experimental work of Berberich,[3] who demonstrated that these cholesteatomas were products of ingrowing skin of the external canal and, particularly, of the posterior superior integument of the external canal. This portion of the skin of the external canal was found to possess a higher degree of stratification than other portions, with a papillary type of formation just at the border of the tympanic membrane in its posterior superior aspect. Such cholesteatomas have been classified as pseudocholesteatomas, secondary to middle ear suppuration.

Pseudocholesteatomas which develop as a result of an early middle ear inflammation without perforation but with invagination of the pars flaccida, by negative pressure or adhesive contracture, are called primary pseudocholesteatomas.[4] Secondary pseudocholesteatomas have been previously described as developing in association with chronic otitis media in the presence of a marginal perforation.

Other possible factors in the formation of cholesteatomas have received consideration from otopathologists. Islands of squamous epithelium have been described as already existing in the tympanum which, when undergoing metaplasia under certain circumstances, may result in the formation of cholesteatomatous matrix and desquamation.[5] A possible relation of the first epibranchial placode to the formation of cholesteatoma has been suggested by Teed.[6] Regardless of the underlying pathogenesis, however, the treatment of cholesteatomas is the same, being governed by the size of the lesions and the suggestion of impending or attendant complications.

The cholesteatoma in the case to be presented is of interest chiefly for two reasons. First, it is considered to be of the rare congenital type, and, second, although its size was tremendous, there were relatively few symptoms. A review of the available literature reveals a case reported by Nanninga [7] of a huge cholesteatoma approaching the present one in size, but it is our belief that the one to be reported is the largest cholesteatoma of the temporal bone yet recorded.

REPORT OF A CASE

J. K., a white man aged 42, was first seen at the Illinois Eye and Ear Infirmary on Sept. 26, 1950, with the chief complaint of a right-sided facial paralysis. He first noted the paralysis one and a half years previously but was told by his physician that it was Bell's palsy, which would eventually clear up. There was no history of aural discharge or vertigo, and, while years ago there had once been some tinnitus noted, it disappeared after cleaning of the external canal. The patient's only symptom related to the ear was some impairment of hearing in the ear of the affected side. No roentgenologic studies were made at the onset of his illness, and the paralysis persisted unchanged.

On examination at the Infirmary, no motion could be seen in any area supplied by the right facial nerve. The right eye could be only partially closed. The tissues of the right side of the face were atrophic and lacked muscular tone. Results of examination of the nose, throat, and left ear were not contributory. Examination of the right ear revealed a more lateral protrusion of the auricle than was present on the left. The external canal was normal, and there was no evidence of discharge. Anteriorly and inferiorly there was a crescent-shaped remnant of the

3. Berberich, J.: Das Mittelohrcholesteatom: Experimentelle und pathologisch-anatomische Untersuchungen, Beitr. Anat., Physiol, Path. u. Therap. d. Ohres **26**:1-94 (Nov.) 1927.

4. Day, K. M.: Primary Pseudocholesteatoma of the Ear, Arch. Otolaryng. **34**:1144-1151 (Dec.) 1941.

5. Tumarkin, A.: Middle Ear Suppuration and Cholesteatoma, J. Laryng. & Otol. **53**:685-737 (Nov.-Dec.) 1938.

6. Teed, R. W.: Cholesteatoma Verum Tympani, Arch. Otolaryng. **24**:455-474 (Oct.) 1936.

7. Nanninga, K. S.: Extremely Large Cholesteatoma Presenting Few Symptoms, Nederl. tijdschr. geneesk. **81**:898-900 (Feb.) 1937.

original tympanic membrane, but the posterior superior two-thirds was replaced by a very thin, atrophic membrane traversed by numerous small blood vessels. This part of the membrane could be oscillated with the Bruning otoscope, and its surface appeared to be convex, with whitish material deposited medial to it. Results of hearing tests were normal for the left ear. In the right ear conversational voice was heard at 15 ft. (4.5 meters) and whispered voice at 2 ft. (0.6 meter). There was no lateralization with the Weber test; the Rinne test was positive for the left and negative for the right ear, and the Schwabach test showed slightly decreased hearing bilaterally. The tuning forks vibrating at 4096 double vibrations per second were heard bilaterally. There was no spontaneous nystagmus or past-pointing. Ninety cubic centimeters of cold water in the left ear produced a first to third degree nystagmus to the right for one minute, and no reaction was produced by stimulating the right ear. However, massive cold stimulation in the right ear produced first and second degree nystagmus to the left for about 20 seconds. Rotation to the right produced a first to third degree nystagmus to the left for 30 seconds. Rotation to the left resulted in only a first to second degree nystagmus to the right for about 10 seconds. No past-pointing was elicited. Galvanic tests with the cathode in the left ear produced a nystagmus with 2 ma. of current; in the right, 6 ma. of current was required. Audiometry revealed normal air conduction on the left and normal bone conduction bilaterally. With 70 db. of masking, there was found to be

Fig. 1.—Patient demonstrating complete facial nerve paralysis and loss of muscular tonus of the right side of the face.

an average hearing loss of about 45 db. in the right ear. Faradic and galvanic stimulation of the facial nerve on the right produced evidence of a complete reaction of degeneration with poor residual muscular contractibility. Electromyography revealed evidence of incomplete denervation of the middle and lower branches of the nerve but complete nerve block in the upper branches with a loss of functional muscle fiber. Neurological examination revealed a loss of taste on the right side of the tongue. Results of ophthalmological and general medical examinations were normal (Fig. 1).

Roentgenologic studies of the mastoids revealed a large spectacular defect on the right side with fairly sharp, smooth margins, extending 2 cm. anterior to the tympanum into the zygoma and 4.5 cm. posterior to the tympanum into the area of the lateral sinus. There was erosion of the tegmen from the cortex medial to the labyrinth and anteriorly and posteriorly over the extent of the lesion (Fig. 2). Roentgenograms showed that the skull and long bones were normal.

Results of laboratory examinations, including tests for serum cholesterol, calcium, and phosphorus, were normal.

On October 20, with the area under local anesthesia, a postauricular incision was made, and the periosteum was elevated. In the area of the suprameatal triangle the cortex of the mastoid was found to be eroded for about 1 cm. posterior to the external canal, and it was

there that a soft, white mass was encountered. The remaining cortex was thin and was removed with a rongeur in all directions until the lateral sinus posteriorly and the dura superiorly were encountered. Both the lateral sinus and the dura superiorly were lying free without any bony covering. It was necessary to extend the usual incision posteriorly and superiorly in order to uncover the very large, soft, white mass. Most of the mass could be removed in one piece, except for portions which extended into the middle ear and zygomatic process. These were removed by means of curettes. The lateral sinus was compressed, and its purplish color suggested that it was probably thrombosed but no aspiration was attempted. The bony tegmen was entirely

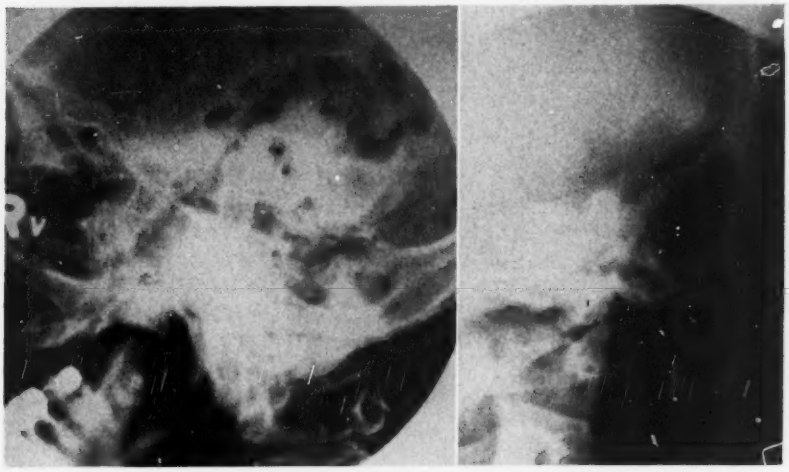

Fig. 2.—Schueller and Stenver's view of the right temporal bone showing extensive destruction of the mastoid and breakthrough into both cerebral fossae.

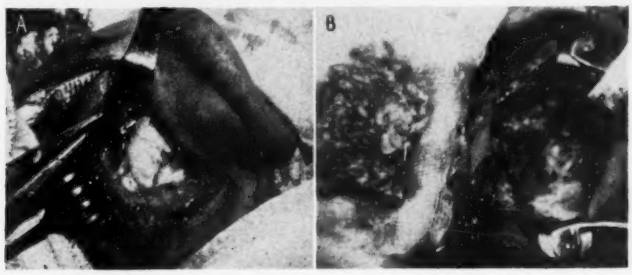

Fig. 3.—*A*, cholesteatoma in situ after removal of thin cortex. *B*, cholesteatoma beside the operative cavity in the mastoid.

absent, and the mass extended medially to the labyrinth, elevating the dura and temporal lobe. The labyrinth was eroded in the area of the horizontal canal, and the dura of the posterior fossa in Trautmann's triangle was exposed. The posterior portion of the bony external canal and the lateral attic wall were absent. No demonstrable remnant of the facial nerve could be found. A piece of one of the ossicles was lying free in the tympanum, and only a small portion of tympanic membrane remained anteriorly. Since there was no demonstrable facial nerve identified, the facial ridge was lowered to provide a wide-open cavity, a plastic lining flap was created from the skin of the external canal, a light iodoform-petrolatum gauze pack was inserted, and the postauricular incision closed (Fig. 3).

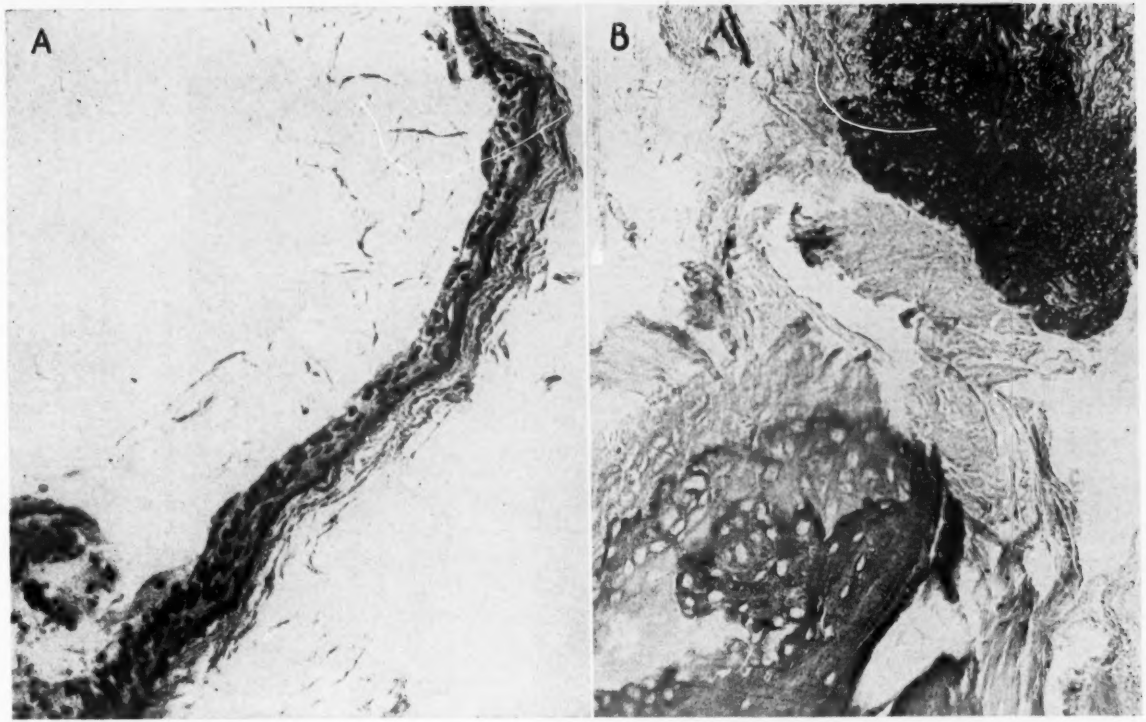

Fig. 4.—*A*, microscopic section through a bony chip from the cortex showing premortal bone with loss of osteocytes in the lacunas and adjacent matrix. *B*, typical cholesteatomatous matrix without the inflammatory changes.

Pathological examination of the specimens removed at examination revealed a cholesteatoma weighing 14 gm. Strips of cholesteatomatous matrix were found, consisting of low, stratified, squamous epithelium, three to four cells in thickness, containing hyperchromatic nuclei. There was no evidence of any inflammatory reaction about the matrix. The removed chips of the mastoid cortex and the posterior wall of the external canal and of the zygomatic area revealed changes usually associated with bone necrosis from pressure. Absorption of bone and scanty new-bone formation at the border of the cholesteatomatous cavity were observed. The mastoid bone itself and the removed ossicle exhibited empty lacunas (Fig. 4).

The postoperative course was uneventful, except for some difficulty the patient experienced in opening his mouth. Roentgenograms of the temperomandibular joint failed to show any disturbance of the joint surface itself, but some decrease in the excursion of the head of the mandible was noted. It was also apparent that the cortical bone of the joint cavity was very thin and possibly dehiscent posteriorly. At the close of the fifth postoperative week the incision was well healed, the operative cavity being large and smooth. A large amount of serosanguinous discharge continued to be present, and there was an intermittent extrusion of some cholesteatomatous material. The patient felt well generally, except for an occasional "feeling of wooziness in warm places."

The postoperative evaluation of the patient's hearing revealed a marked loss on the right as compared with the preoperative record. The postoperative loss amounted to an average of 80 db. as compared with a preoperative level of 45 db. There was still no tendency for lateralization of the Weber test. A caloric test carried out after insertion of a rubber finger cot into the cavity produced no response.

SUMMARY

A review of the complex classification together with some of the accepted theories of the pathogenesis of cholesteatomas has been presented. A true cholesteatoma of unusual dimensions, with but insignificant symptoms (there being no aural pain, discharge, vertigo, or persistent tinnitus), despite the absence of the tympanic membrane, posterior bony canal, and lateral attic wall, is reported as found at surgery. Because of these characteristics and the absence of any evidence of inflammation in the pathology specimens, we feel that this cholesteatoma should be reported as true cholesteatoma, and because of its immense size and weight of 14 gm. it should be considered as one of the largest true cholesteatomas yet reported in the literature.

HEMILARYNGECTOMY—A MODIFIED TECHNIQUE FOR CORDAL CARCINOMA WITH EXTENSION POSTERIORLY

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IN THE surgical treatment of carcinoma of the larynx, the all-important objective must necessarily be the complete eradication of the neoplasm. Often the larynx must be sacrificed and an extensive dissection of the cervical glands performed in order to excise sufficiently wide of the disease. Preservation of laryngeal function with the maintenance of an intact respiratory tract is of secondary consideration. However, total laryngectomy need not always be resorted to if a more conservative procedure such as thyrotomy, hemilaryngectomy, or pharyngotomy will save the larynx without too great an additional risk of recurrence.

The likelihood of preserving the larynx in the surgical treatment of carcinoma depends upon the location of the tumor and its extent of invasion. In my experience, the microscopic characteristics of laryngeal carcinoma have little or no bearing on the response of the tumor to either surgery or radiotherapy. Limited cordal neoplasms are singularly suitable for thyrotomy because of their slow growth and relatively late metastases. Even when the growth has extended anteriorly to the commissure, laterally to the ventricle, or posteriorly to the vocal process, there is still the probability of affecting a surgical cure by a more extensive procedure than cordectomy via thyrotomy.

Because of the severe resulting disability often associated with laryngectomy, I have attempted, in selected patients, to preserve an intact larynx by the more conservative surgical procedure of hemilaryngectomy.

Malignant tumors of the true vocal cord and the ventricle which extend posteriorly so as to involve the vocal process cannot be completely excised by laryngofissure. Hemilaryngectomy has heretofore rarely been performed because the resulting contractures of the glottis generally render the airway useless. Permanent tracheostomy is required. A total laryngectomy thus becomes the only surgical procedure, even though the other half of the larynx is free of disease and might probably be salvaged. The pioneer hemilaryngectomy operation, as performed by Gluck,[1] was employed for extensive unilateral lesions which today would hardly be considered amenable to any procedure other than total laryngectomy or radiotherapy. In order to overcome the ensuing stenosis of the glottis after removal of half the

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1. Gluck in Kirschner, M.; Lautenschläger, A., and Kleinschmidt, O.: Operative Surgery, Philadelphia, J. B. Lippincott Company, 1937, Vol. 3, pp. 397-405.

larynx, plastic procedures were done. The large operative defect was temporarily covered with folding-door skin flaps, and a laryngostomy was performed. After healing of the mucocutaneous border had occurred, the opening was closed by sliding-skin flaps. Such surgical procedures were not only lengthy and cumbersome but also accompanied by a high operative mortality due to aspiration pneumonia and mediastinitis. The results were not gratifying, and local recurrence with cervical metastases was common.

It would seem that if the indications for this procedure were restricted to lesser lesions and if the resultant stenosis could be overcome easily, the operation of hemilaryngectomy might be more useful. The advent of chemotherapy and antibiotics makes the operative procedure safer now. Certainly, many patients requiring laryngectomy can contemplate a happier existence without the troublesome tracheotomy tube if hemilaryngectomy proves to be an effective procedure in unilateral lesions.

Recently, Dr. Henry Goodyear [2] reawakened interest in hemilaryngectomy and presented an obturator which could assure ample airway after complete healing without the necessity of resorting to skin flaps. He suggested that the obturator and tracheotomy tube be worn 10 to 12 wk. In June, 1950, Dr. Frederick Figi [3] reported three cases of laryngeal carcinoma removed by hemilaryngectomy with immediate skin graft for repair. The patients are free of disease to date, some three years after surgery. The employment of immediate skin grafting for restoring the lining of the larynx prevented cicatricial stenosis. Dr. Figi has since used a similar procedure on six additional patients, all of whom have remained free of disease to date.

I have performed five hemilaryngectomies within the past year for local resection of carcinoma of the vocal cord and ventricle with posterior extension onto the vocal process of the arytenoid. In none of these cases could complete extirpation have been done by laryngofissure. It is at times difficult to determine the exact limits of the malignant growth preoperatively. The final decision to do a hemilaryngectomy can be made only after adequate exposure of the neoplasm by thyrotomy with thorough visualization of the extent of the tumor.

TECHNIQUE

Local anesthesia is employed in exposure of the interior of the larynx for inspection by laryngofissure. If the tumor is found to be locally resectable, a tracheotomy through the second tracheal cartilage is performed. The laryngeal mucosa is now thoroughly topically anesthetized with a 20% solution of cocaine and epinephrine. The submucosa of the interarytenoid region is infiltrated with a 1% solution of procaine hydrochloride. An L-shaped incision (Fig. 1*A*) through the mucosa is made in the interarytenoid area. The vertical part is placed in the midline, somewhat to the uninvolved side, and the horizontal portion is parallel to the upper border of the cricoid cartilage. A triangular mucosal flap is thus raised, and the fibers of the interarytenoid muscle are incised, care being taken not to injure the underlying pharyngeal mucosa. A posterior submucosal resection of the arytenoid is then performed by blunt and sharp dissection. It is important that the anterior pharyngeal mucosa is not traumatized, as it will be used in the plastic closure. The outer aspect of the thyroid also is injected with procaine hydrochloride, and the superior laryngeal nerve of the affected side is infiltrated. A subperichondrial

2. Goodyear, H. M.: Hemilaryngectomy: Method of Maintaining a Satisfactory Airway and Voice, Ann. Otol. Rhin. & Laryng. **58**:581-585 (June) 1949.

3. Figi, F. A.: Removal of Carcinoma of the Larynx with Immediate Skin Graft for Repair, Ann. Otol. Rhin. & Laryng. **59**:474-486 (June) 1950.

separation of the strap muscle overlying the thyroid alae is done (Fig. 1*B*). The attachments of the thyrohyoid and sternothyroid muscles along the oblique line are severed by sharp dissection. At the lower border of the thyroid cartilage the cricothyroid muscle must be detached carefully and the cricothyroid artery ligated. The cricothyroid joint is severed, thereby freeing the lateral wing of the thyroid cartilage. The attachment of the pharyngeal constrictor muscle can then be incised along the posterior rim of the thyroid cartilage. The upper cornu of the thyroid cartilage

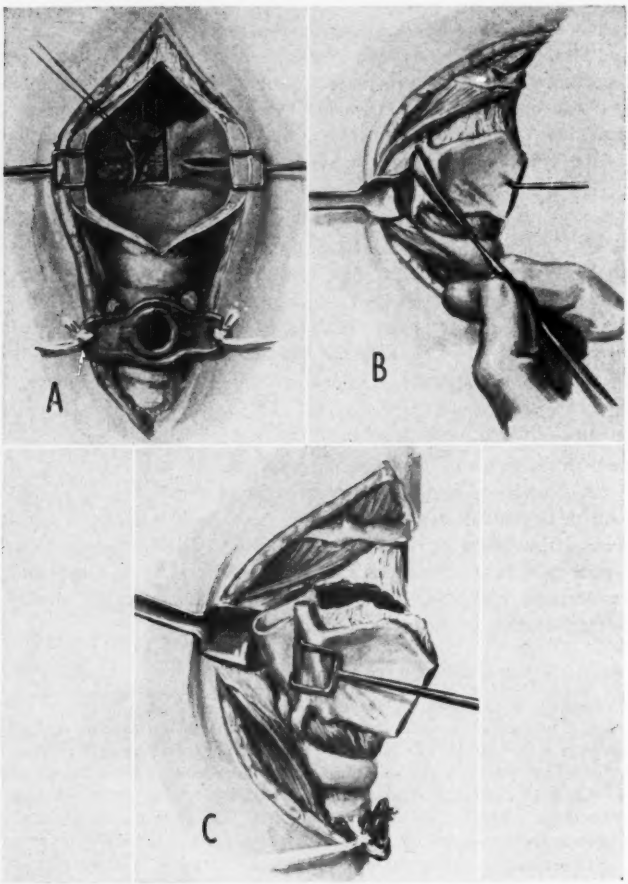

Fig. 1.—*A*, a tracheostomy is performed through the second tracheal ring. An L-shaped incision through the mucosa is made in the interarytenoid region, and a triangular mucosal flap is raised. The fibers of the interarytenoid muscle are incised, and a submucosal resection of the arytenoid is begun. *B*, subperichondrial separation of the strap muscles overlying the thyroid cartilage is done. At the lower border, the cricothyroid muscle must be detached and the cricothyroid joint exposed. The insertion of the inferior pharyngeal constrictor muscle is then incised along the posterior rim of the thyroid cartilage. *C*, the superior cornu of the thyroid cartilage is cut after ligation of the superior laryngeal vessels. The cricothyroid joint is severed, and the thyroid wing is thus freed and pulled to the opposite side. A careful separation of the pharyngeal mucosa from the inner aspect of the thyroid cartilage and the posterior surface of the arytenoid cartilage is performed. The thyrohyoid membrane is cut horizontally, and the pharyngeal mucosa is incised wide of the tumor.

is skeletonized after ligation of the superior laryngeal vessels. The thyroid wing is pulled to the opposite side by means of a double-hook retracter in the posterior border. A careful separation of the pharyngeal mucosa from the inner aspect of the thyroid must be done (Fig. 1*C*). At this stage, the procedure is not unlike that done in the Woodman arytenoidectomy. The mucosa is peeled off the posterior aspect of the cricoid cartilage. The complete separation of the arytenoid is accomplished by dissection of the mucosa from the pyriform fossa and continuation medially onto the arytenoid. The crico-arytenoid joint is then disarticulated. The thyrohyoid membrane is cut horizontally, and the pharyngeal mucosa is incised wide of the tumor. The mucosa covering the posterior aspect of the arytenoid is preserved, care always being exercised to be wide of the lesion. The resected specimen is then delivered by horizontal incision along the upper border of the cricoid cartilage.

The defect produced by such wide excision is appreciable (Fig. 2*A*). However, the mucosa of the hypopharynx is very redundant and can usually be mobilized sufficiently to cover almost the entire area. This is rendered possible by the fact that the arytenoid is now missing and the mucosal flap can be bridged across the inner aspect of the strap muscles laterally and to the cricoid mucosa inferiorly (Fig. 2*B*). The surface loss, incident to the surgery, is thus overcome by replacement with pharyngeal mucosa.

A slab of absorbable gelatin sponge (gelfoam®) moistened in thrombin is applied to the suture line, and an acrylic obturator is inserted into the laryngeal lumen. I employ a modified Goodyear acrylic obturator (Fig. 3*A*). The distal, or tracheal, end is shaped to accommodate a No. 7 tracheotomy tube. The proximal, or pharyngeal, end instead of being round as in the original model has a bilateral concavity near the bulbous tip. This recession facilitates the removal of the mold by direct laryngoscopy, since it allows a firmer grasp with the laryngoscopic forceps. In addition, the obturator has a smooth bulge to the right or left side. This convexity is placed on the side of the larynx operated on. It not only prevents contracture of the lumen but also helps to approximate the mucosal flap to the raw surface. The length of the mold is such that when it is fixed in place by the tracheotomy tube through the second tracheal ring the widest portion will be opposite the intact vocal cord (Fig. 3*B*). The incision is closed completely in layers, and the obturator remains in situ for 10 to 12 days, after which time it is removed by direct laryngoscopy. No oral feeding is given for the first three to five days, but fluids are administered intravenously. After this interval, semisolid foods usually are swallowed well. The mold does not seem to interfere with swallowing, but fluids are not well tolerated for the first 10 to 14 days. Decannulation can be done after 17 to 21 days.

The laryngeal airway has remained perfectly adequate in all my patients; in fact, the lumen has been no smaller than that resulting from laryngofissure. A new vocal band develops at a lower level than the intact vocal cord. This fibrous cord stretches across the upper border of the cricoid cartilage, being fixed to it anteriorly and posteriorly. Because it is at a lower level than the normal vocal cord, the glottis becomes S-shaped, thereby enlarging the laryngeal lumen. In spite of this failure of apposition of the vocal cords, the voice is surprisingly good, comparable to the voice after laryngofissure.

The following five cases are of patients with unilateral carcinoma of the larynx who were operated on by hemilaryngectomy within the last year. The lesions were of such extent that thyrotomy would have been impracticable and laryngectomy would have been the only alternative. The use of an acrylic obturator and the submucosal resection of the arytenoid with the mobilization of pharyngeal mucosa has prevented stenosis in every instance. The follow-up period is indeed too short to allow any claims regarding the control of the disease; however, the excellent results thus far obtained justify the further trial of this procedure in selected patients.

REPORT OF CASES

CASE 1.—S. J., a 48-yr.-old man, had been hoarse for two months. Indirect laryngoscopy showed an infiltration of the entire right vocal cord, involving the vocal process and extending into the ventricle. There were some limitation of abduction of the right cord and a fulness of the ventricle. Biopsy showed squamous-cell carcinoma, and a right hemilaryngectomy was

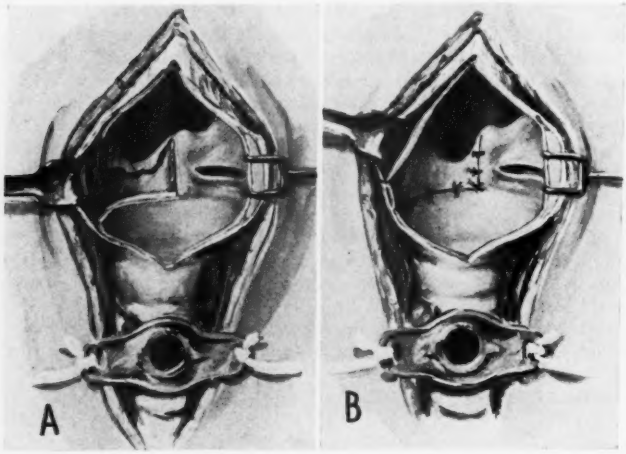

Fig. 2.—*A*, the resected specimen has been delivered by a transverse incision along the upper border of the cricoid cartilage. The defect resulting from this wide excision is appreciable but can be adequately covered by mobilization of the redundant hypopharyngeal mucosa. *B*, the mucosal flap is bridged across the defect and sutured to the superior border of the cricoid cartilage and to the inner aspect of the strap muscles.

Fig. 3.—*A*, the modified Goodyear acrylic obturator. The distal, or tracheal, end is shaped to accommodate a No. 7 tracheotomy tube. *B*, the proximal end has a concavity which facilitates removal by direct laryngoscopy. The convexity is placed toward the resected side of the larynx and helps to approximate the mucosal flap to the raw surface.

performed. The obturator was removed on the 14th day postoperatively, and decannulation was done on the 34th day. He has a more than adequate airway and a good voice.

The surgical specimen (Fig. 4*A*) demonstrated the lesion extending over the vocal process and infiltrating the ventricle. The posterior skeletonized surface of the arytenoid could be seen (Fig. 4*B*), and the pyriform fossa denuded of the pharyngeal mucosa could be visualized.

CASE 2.—J. P., a 53-yr.-old man, had been observed in another country for about six months because of hoarseness. A fulness of the right ventricle had been noted, and tomography showed

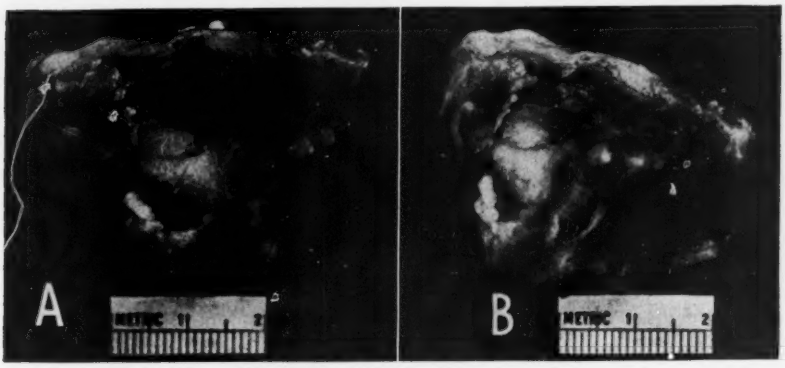

Fig. 4 (Case 1).—*A*, the medial surface of the surgical specimen shows the carcinomatous lesion extending over the vocal process and infiltrating the ventricle. Posterosuperiorly, the site of incision of the upper cornua from the thyroid ala can be identified. The inferior cornua which has been severed from the cricoid joint is also visible. *B*, oblique view of the specimen. The posterior skeletonized surface of the arytenoid can be seen, and the pyriform fossa denuded of the pharyngeal mucosa is visualized. The excision is wide of the lesion in all directions.

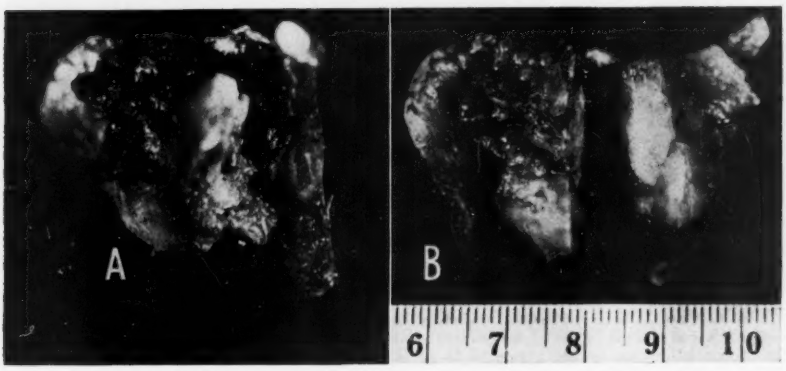

Fig. 5 (Case 2).—*A*, resected thyroid wing showing posterior border of the cartilage with the mucosa freed from its inner aspect and from the arytenoid. The tumor protrudes through the false cord. Normal mucosa can be seen inferiorly in the subglottic region and superiorly along the upper border of the thyroid cartilage. *B*, coronal section through the specimen showing obliteration of the laryngeal ventricle by neoplasm.

a prominence of the right false cord. Mirror examination revealed a firm mass covered by an intact mucosa in the right laryngeal ventricle. A biopsy specimen taken from the ventricle after perforation of the mucosa was reported as showing squamous-cell carcinoma, and hemilaryngectomy was performed. The obturator was removed on the 10th day postoperatively and decannula-

tion was done 18 days after hemilaryngectomy. He has remained free of disease with an adequate airway and fairly good voice.

Examination of the surgical specimen (Fig. 5*A*) showed the tumor protruding through the false cord as a result of the biopsy specimen taken and surgical manipulation. Normal mucosa could be seen both inferiorly in the subglottic area and superiorly along the upper border of the resected thyroid cartilage. The arytenoid and pyriform fossa denuded of mucosa could be identified. A coronal section through the specimen showed the obliteration of the ventricle by neoplasm (Fig. 5*B*). Frozen sections made during the surgical procedure and microscopic

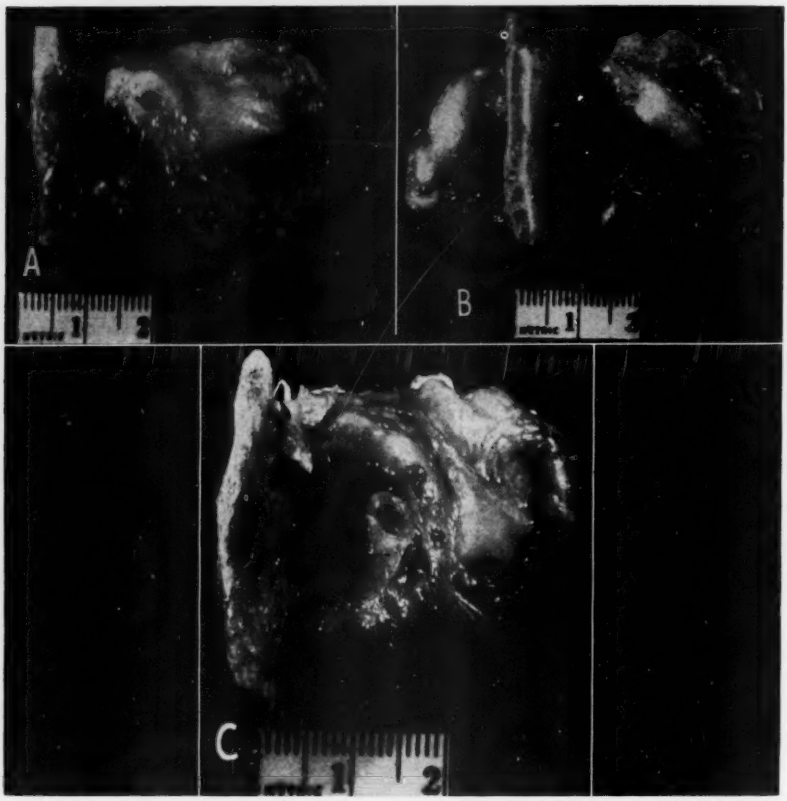

Fig. 6 (Case 3).—*A*, left hemilaryngectomy specimen showing the ulcerative lesion extending over the vocal process of the arytenoid and infiltrating the ventricle. *B*, coronal section through the specimen illustrating the extension of the carcinoma submucosally into the left false cord. The thyroid cartilage is uninvolved. *C*, oblique view of the specimen demonstrating the posterior exposed surface of the arytenoid and the denuded pyriform fossa. Normal mucosa, wide of the lesion, can be seen above the false cord and subglottically.

examination in serial sections of the specimen revealed the incised edges to be wide of the neoplasm.

Case 3.—Y. M., a 68-yr.-old man, was admitted to the hospital for hoarseness of several months' duration. Laryngeal examination showed an ulcerative lesion involving the entire left vocal cord and extending over the vocal process and into the ventricle. The anterior commissure was free, and there was no fixation of the cords. Biopsy showed a squamous-cell carcinoma.

and a hemilaryngectomy was performed. The acrylic mold was removed on the ninth postoperative day, and decannulation was done on the 19th day after surgery. He has had an adequate airway and fairly good voice to date. Two months after hemilaryngectomy, a small granuloma was detected in the anterior commissure. This was removed and proved to be granulomatous tissue without any evidence of tumor. The larynx was completely healed at the time of this writing.

Examination of the surgical specimen showed the ulcerative lesion on the true cord extending over the vocal process (Fig. 6*A*). A coronal section, through the center of the cord, illustrated the extension of the neoplasm submucosally into the false cord (Fig. 6*B*). An oblique view (Fig. 6*C*) demonstrated the posterior surface of the arytenoid and the pyriform fossa. Normal mucosa wide of the lesion could be visualized above the false cord and subglottically.

CASE 4.—J. D., a 42-yr.-old man, was admitted to the hospital because of hoarseness of three months' duration. Indirect laryngoscopy showed an extensive ulcerative lesion of the entire right vocal cord, extending over the vocal process. The left cord was uninvolved, and there was no limitation of motility. A biopsy showed squamous-cell carcinoma, and a right hemilaryngectomy was performed. The obturator was removed on the 15th day postoperatively. The patient was able to swallow solid food but had difficulty taking fluids, which produced violent

Fig. 7 (Case 4).—*A*, right hemilaryngectomy specimen showing malignant lesion of the right cord and involvement of the vocal process. *B*, horizontal section through arytenoid cartilage illustrating the extension of the neoplasm onto the vocal process.

spasms of coughing. He had severe reaction to penicillin therapy, consisting of high temperature and skin eruption. Shortly thereafter pneumonia developed, which promptly subsided after chloramphenicol (chloromycetin®) therapy. The tracheotomy tube was removed on the 33d postoperative day, at which time he was tolerating fluids well. He has had an adequate airway and good voice to date.

Examination of the surgical specimen (Fig. 7*A*) showed the lesion on the right vocal cord, extending over the vocal process. The denuded arytenoid and pyriform fossa could be visualized posteriorly. A horizontal section through the arytenoid demonstrated the extension of the neoplasm up to the vocal process (Fig. 7*B*).

CASE 5.—J. P., a 58-yr.-old man, was referred to the hospital because of hoarseness which persisted in spite of penicillin therapy. Indirect laryngoscopy showed a sessile lesion on the right vocal cord, extending up to the vocal process. There was no impairment of motility, and the anterior commissure was uninvolved. A biopsy was reported as showing squamous-cell carcinoma, and a right hemilaryngectomy was performed. The obturator was removed on the 11th postoperative day, and decannulation was done on the 19th day after surgery. The patient's airway has been adequate and his voice good to date. Examination of the resected hemilarynx

showed the ulcerative lesion involving the entire vocal cord including the vocal process (Fig. 8*A*). A vertical section anterior to the arytenoid revealed the invasion of the substance of the true cord (Fig. 8*B*).

All the five patients who were treated by hemilaryngectomy have done well and have returned to their regular occupations. Their average stay in the hospital was 25 days. Although the period of observation was certainly very short, the appearance of the larynx was very encouraging. The use of the obturator, combined with the mobilization of the pharyngeal mucosa for plastic closure, has succeeded in maintaining an adequate airway and in preserving a fairly good voice. The ultimate result as regards complete eradication of laryngeal disease will have to be determined after prolonged follow-up.

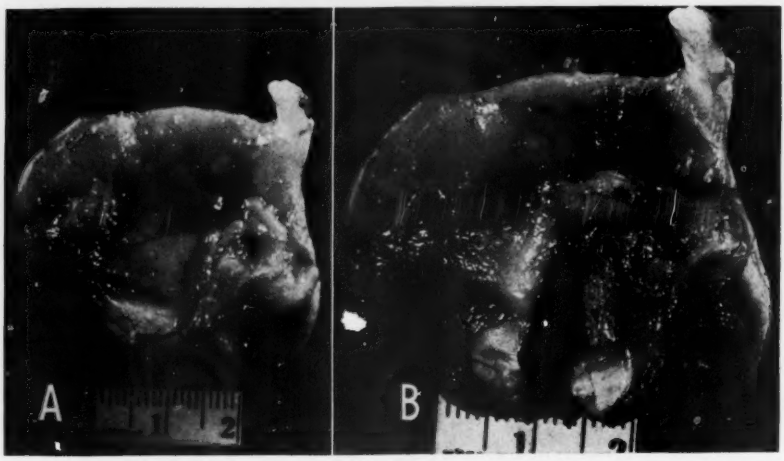

Fig. 8 (Case 5).—*A*, right resection hemilarynx showing the ulcerative lesion involving the entire vocal cord, including the vocal process. *B*, vertical section immediately anterior to the arytenoid revealing the incision of the substance of the vocal cord and arytenoid.

SUMMARY

In selecting the method of therapy in any individual case of laryngeal carcinoma, my decision has always been guided by a desire to preserve laryngeal function without endangering the patient's life.

Malignant tumors of the larynx, particularly vocal-cord carcinomas, are generally slow-growing. Regional and distal metastases occur less frequently and at a later stage of the disease than in most other organs of the body. Acknowledging that carcinoma is unpredictable in its spread, it would still seem that in neoplasms of the vocal cord and ventricle there is a better chance of eradicating the disease by local resection than there is elsewhere. Dr. John D. Kernan [4] has said, "It sometimes strikes one as unnecessary to remove a whole larynx when three-fourths of it appears to be healthy."

4. Kernan, J. D.: The Pathology of Carcinoma of the Larynx Studied in Serial Sections, Tr. Am. Acad. Ophth. **55**:10-21 (Sept.-Oct.) 1950.

Hemilaryngectomy has been restricted to those lesions which involve the vocal cords and extend laterally into the ventricle or posteriorly onto the vocal process of the arytenoid. All five patients who were so treated have done well and have returned to their regular occupation. The use of the acrylic obturator, combined with the mobilization of the pharyngeal mucosa for plastic closure, has succeeded in maintaining an adequate airway and in preserving a fairly good voice.

The ultimate outcome as regards control of the laryngeal disease will have to be determined after prolonged follow-up. To date, the results are sufficiently encouraging to justify further trial of these procedures to determine the role of surgery and radiotherapy in the treatment of laryngeal tumors.

DISCUSSION

DR. JOHN D. KERNAN: Dr. Som has brought up one of the most important points which concerns laryngeal surgery. There is no other place in the body in which it is possible to preserve the function following surgery for cancer to so great an extent as in the larynx. This is because so many laryngeal cancers manifest the symptoms early; that is to say, a patient with a laryngeal cancer will become hoarse very early in the disease, since the first structure affected is the vocal cord. Cordal cancer may be removed, by either surgery or radiotherapy, with almost complete preservation of function. Hitherto, it has been the custom among surgeons to perform a total laryngectomy if the tumor has extended beyond the cord. Dr. Som has demonstrated that even rather extensive tumors may be removed with preservation of the laryngeal function and the patient's life. His pictures have shown the procedure excellently. The actual performance of the operation as I have seen it appeals even more to the surgeon's heart. I hope that this operation will have a wide use.

Having said these complimentary things about this procedure, I think it is justifiable to say that the necessity for doing it should hardly ever arise. It is evidence of medical remissness that such advanced laryngeal cancers are still seen. As I said before, the chief symptom, hoarseness, manifests itself early, and the diagnosis of an early lesion is easy. None of these should be missed, and yet we still see a great many advanced cases. This is something that all members of our specialty should join in correcting.

SPECIAL KIND OF ACOUSTIC TRAUMA PRODUCED BY JET ENGINES

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SOME TIME ago, it came to our notice that the airport personnel of jet-propelled planes ("Vampires") after a comparatively short time were affected with hearing disorders, such as impaired hearing, buzzing and diplacusis. These lesions seem to have arisen in spite of ear defenders introduced into the meatus and working on the principle of low-pass filters developed in our experiments on noise and report traumas. In order to study the special properties, if any, of jet-engine noise, sound analyses were performed on flying "Vampires" as early as the summer of 1946. A peculiar feature of those experiments was the impossibility of detecting the origin of the characteristic whistling sound of jet planes. It was first supposed to be formed subjectively within the ear, like the stroke sound of bells, only further measurements, undertaken in May, 1950, brought full explanation of the sound produced by "Vampire" planes and its cause. After the negative results of earlier experiments with flying "Vampires," more exact measurements were carried out with stationary planes.

On the ground the time for measuring is practically unlimited, and Doppler effects, considerable at high speed, are eliminated. Moreover, as we already mentioned, hearing lesions are particularly numerous among the airport staff, making it advisable to perform measurements not on flying machines but on stationary planes. The sketch (Fig. 1) diagrammatically shows the disposition of the three measuring points: Point 1 is near the aspiration hole at the front of the plane; Point 2, on its side to the rear, and Point 3, in the pilot's cabin.

METHOD

For measurement of sound pressure we used a condenser microphone with a flat frequency response from 50 to 12,000 cps. Sound pressure was measured directly in microbars (μb) and transposed into decibels (0 db.$=2\times10^{-4}$ μb). Furthermore, the time function of the sound pressure was taken on the spot and photographed by means of a cathode-ray oscillograph. Simultaneously, the noise produced was registered every time on a magnetic tape recorder of high quality. This noise was analyzed later in the laboratory by frequency analysis with a band width of 50 cps.

RESULTS OF THE MEASUREMENTS

Measurements were performed under the two following conditions:

(*a*) Idling: speed of the gas turbine, 3,000 rpm.

(*b*) Full speed: speed of the gas turbine, 10,700 rpm.

From the Clinic of Oto-Rhino-Laryngology at the University of Zurich, Prof. L. Rüedi, M.D., Director; Research Laboratories of the Swiss Post, Telegraph and Telephone Administration, Prof. W. Furrer, Director, and Air Medicine Institute, Dübendorf, Switzerland, K. Wiesinger, M.D., P.D., Director.

(*a*) *Idling.*—At Point 1 (air inlet) a whistling of extraordinary intensity is to be heard. The spectrum (Fig. 2) shows a strongly stressed component of 850 cps, which surpasses the general noise spectrum by 30 db. The oscillogram shows a nearly pure sinus wave of 850 cps (Fig. 3). The noise at this point is then essen-

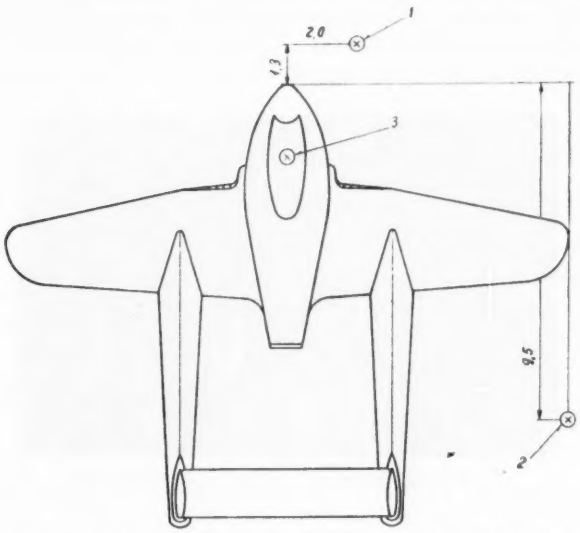

Fig. 1.—"Vampire" jet plane with the three measuring points used.

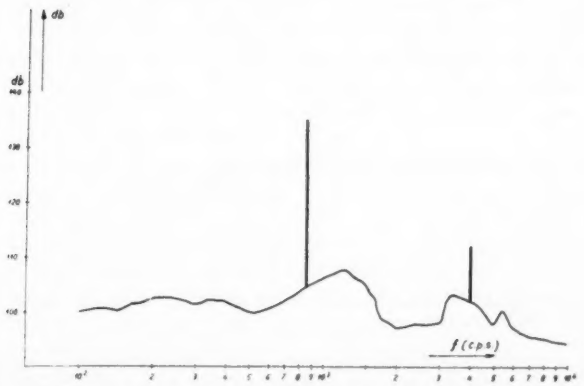

Fig. 2.—Spectrum of "Vampire" noise while idling at 3,000 rpm. Distance of the measuring microphone was 4 m.

tially a pure tone whose harmonics are, all of them, more than 30 db. lower. This tone is produced by the siren effect of the compressor, which has 17 blades and, therefore, at 3,000 rpm, yields 850 cps. The radiation of this tone is very directional, with special stress on the forward direction, parallel to the plane's axis.

At about 4 m. from the aspiration hole we measured a sound pressure of 124 db. At 1 m., at which distance the mechanic has to stand in order to start the turbine, the sound pressure will be 136 db. This value may vary, owing to near-field effect, by ± 6 db.

At measuring-point 2 (sideways, at the rear) the above-mentioned 850 cps component of the compressor is still the strongest, still exceeding the neighboring noise level. Besides this, another component of 4150 cps becomes clearly noticeable, which surmounts the general noise level by about 20 db. and the intensity of which

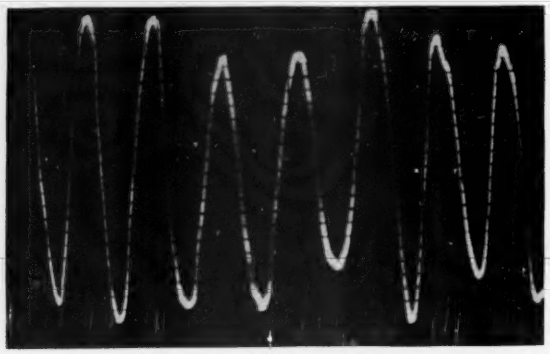

Fig. 3.—Oscillogram of "Vampire" noise while idling.

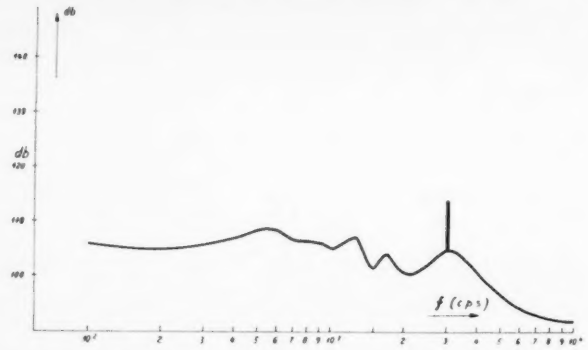

Fig. 4.—Spectrum of "Vampire" noise at full speed, 10,700 rpm. The distance of the measuring microphone was 4 m.

is 11 db. less than that of the 850-cps component. Both components are also clearly visible on the oscillogram and are perfectly audible. The component of 4150 cps is produced by the siren effect of the turbine (83 blades, 3,000 rpm = 4150 cps). This frequency is also radiated very directively with the maximum probably located in the plane's axis. Owing to the hot-gas stream, however, it was not possible to make measurements in this place.

At Point 3 (pilot's cabin) the sound pressure was about 115 db. The component of 850 cps is only 20 db. higher than the general spectrum; as a matter

of fact it is still more damped, since the pilot's cabin could not be closed up completely because of the microphone cable.

(*b*) *Full Speed* (10,700 rpm).—At Point 1 sound pressure went up to 138 db. The spectrum is reproduced in Figure 4. The siren tone of the compressor rises to about 3000 cps, and, in proportion to the remaining noise level, it is considerably lower than before, surpassing it by only 9 db. Nevertheless, this component of 3000 cps is still well audible and gives rise to very disagreeable sensations.

At measuring-point 2 the result of analysis is completely identical with that of Point 1. The siren tone of the turbine, corresponding to 14800 cps, exceeds the measuring range of the analyzer, being so near the upper perception limit of the ear that it is completely covered by the extremely strong drift noises of the expelled gas stream.

COMPARISON WITH A PROPELLER PLANE

For the sake of completeness we shall also mention in this connection the noise analysis of August, 1946, of a "Vampire" jet-propelled plane and a Messerschmidt propeller plane. As pointed out in the beginning, it was not possible then to detect the pure-tone components of the "Vampire" noise on account of lacking band width (5 cps) of the frequency analyzer. Nevertheless, the results showed very clearly that, with the exception of the whistling sounds, the general noise spectrum of the jet plane is lower than that of the propeller plane.

EFFECT ON THE EAR: PROTECTIVE MEASURES

The preceding results of measurements clearly show that the number of revolutions even at idling produces sound pressures in the vicinity of the plane which may be very harmful to the unprotected ear. This applies particularly to the airport staff, since the pilot is comparatively protected by the cabin and, above all, by his cap with the telephone receivers. The sound attenuation due to the pilot's cabin can be estimated at about 15 db., and further attenuation by means of the cap is at least 10 db., so that the sound pressure on the pilot's ear is at any rate 25 db. less than at measuring-point 1. On the other hand, the mechanic in charge of the starting operations is exposed to an extremely strong acoustic strain, which is mainly produced by a pure tone of about 850 cps.

In former investigations we studied in detail the noxious effect of pure tones as shown in human and animal experiments.[1] The human ear was exposed to pure tones within a range of frequencies from 270 to 7000 cps and of sound pressures from 130 to 140 db., which pressures were produced by loud speaker or earphones provided with electromagnetic, electrodynamic, or piezoelectric driving systems, according to the range of frequencies. The measurements of sound pressure were carried out by a calibrated condenser microphone. For measuring hearing losses we employed a normal audiometer with an electrodynamic telephone. Pitch was measured by comparing a tone of constant frequency in the impaired ear with one of variable frequency in the normal ear.

Figure 5 shows the result of exposure of the human ear to the pure tone we are particularly interested in, i. e., 800 cps, 140 db., for two minutes. The hearing loss in the human ear produced thereby begins at 600 cps and increases rapidly to 1100 cps (maximum loss 40 db.); with still higher frequencies it gradually declines.

1. Rüedi, L., and Furrer, W.: Das akustische Trauma, Pract. oto-rhino-laryng. **8**:177-372, 1946.

Besides the very marked sensation of deafness, tones above 800 cps appear strongly distorted. On examination of the sensation of pitch, the most injured range of frequencies presents considerable alterations; between 800 and 2000 cps there occur pitch increases up to 30%. These increases in pitch as well as the sensation of deafness disappear within three days.

Animals (guinea pigs) were also subjected to exposures to pure tone with 800 cps and 100 db. for 638 hours. The resulting functional damage could be measured to a certain extent by the pinna reflex test, which shows though unsystematic hearing loss. The table reproduced in Figure 6 illustrates the functional deficiency and the first histological changes, which in the cochlear area appear as early as about 100 hours after exposure, i. e., much earlier than in the experimental reconstruction of noise trauma. The histological changes begin in the outer hair

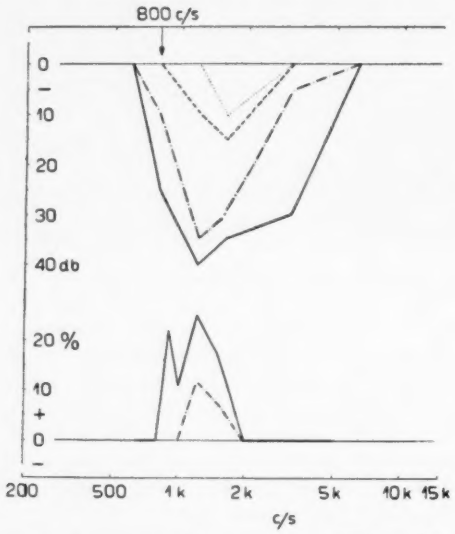

Fig. 5.—Damage to the human ear with a pure tone (800 cps, 140 db., 3 in.). Above, hearing loss; below, alteration in pitch.

cells, whose disappearance already at the beginning of the injury extends over a half or even a whole spiral. Sometimes the extension of the injury varies within the attacked area, and islands without damage to the organ of Corti remain in the degenerate cochlear spiral. Moreover, in the test series of 800 cps, the degeneration area, varying in breadth with each case, is by no means located in the same place in all instances. The location of the affected area may differ by several spirals for the same tone of 800 cps. This paradoxical irregularity of location and formation of the degeneration areas produced by pure tones as opposed to the uniform situation and disposition of the degeneration focus in the organ of Corti can best be seen in the tabular comparison of the diagrams in question.

These experimental pure-tone traumas seemed to be until now of only theoretical interest, since in practice there were hardly any cases in which pure tones of this frequency and intensity occurred as injuring factors. As far as we know, our sound

measurements of jet-propelled planes revealed for the first time a practical basis for the origin of a pure-tone trauma.

For further examination we performed acoustic exposures on normal persons with the following results:

Four persons with normal hearing were examined with an audiometer immediately before the test. Then they had to stand at measuring Point 1 of the "Vampire" for 10 minutes, two of them without ear defenders and the other two duly protected, while the machine was idling (3,000 rpm). Twenty minutes after

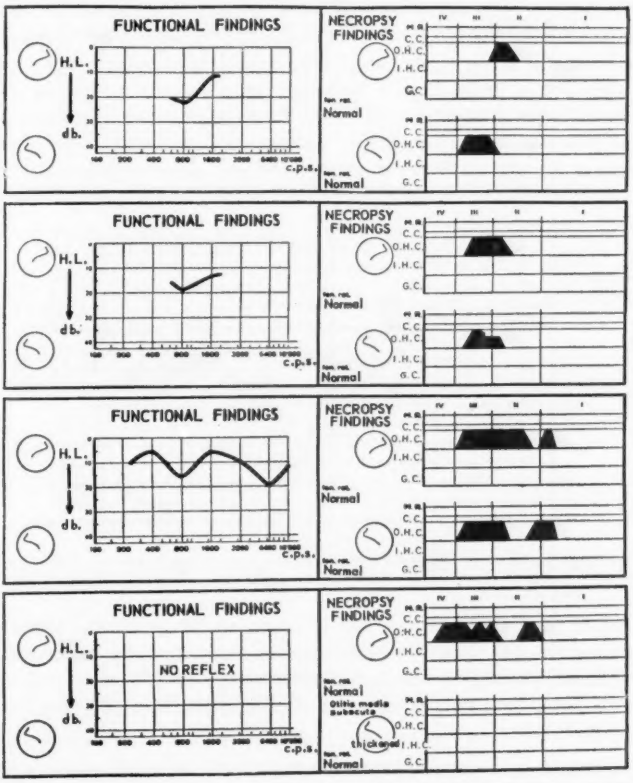

Fig. 6.—Tabular classification of the functional and histological findings in guinea pigs after overstimulation with a pure tone (800 cps and 100 db.) for 638 hours. There were no recoveries. *H.L.* stands for hearing loss, *db.* for decibels, *cps* for cycles per second, *M.R.* for membrane of Reissner, *C.C.* for covering cells, *O.H.C.* for outer hair cells, *I.H.C.* for inner hair cells, *G.C.* for ganglion cells and *fen. rot.* for fenestra rotunda.

the exposure, the four test persons were again examined with an audiometer. The unprotected persons had suffered a clear hearing loss. Figure 7 reproduces the audiogram of the test person N. G. As low as 500 cps the air-conduction and bone-conduction curves showed a sharp drop, which attains its maximum at 1,500 cps (= —35 db.); then the curves gradually rose again and returned to normal at 8000 cps. The similarity of the hearing-loss curve with gas-turbine noise (3,000

rpm) to the audiogram with experimental pure-tone trauma of 800 cps is clearly visible. Thus, the "Vampire" plane at idling causes a substantial hearing loss between 500 and 8000 cps by the dominating pure tone of 850 cps, as is typical of the pure-tone trauma at 800 cps with the exception of the c^5 dip which characterizes the noise and report traumas.

The recovery from the hearing loss incurred by the test takes place within 24 hours. Within the same time the very disagreeable rustling, a sensation of pressure and diplacusis disappear as well. The persons protected by Rüedi-Furrer ear defenders suffered no hearing loss from jet-plane noise.

These tests prove conclusively that jet-propelled planes, above all when idling, endanger the airport staff. As soon as the number of revolutions increases, sound pressure may still grow a bit, but at the same time the siren tone of the compressor rises less in proportion to the remaining noise level so that at 10,700 rpm it exceeds the general level by 9 db. only. Thus the jet-plane noise loses its special pure-tone property, present at idling, and the now-occurring injuries only show the typical c^5 dip characteristic of every noise and report trauma. The extent of

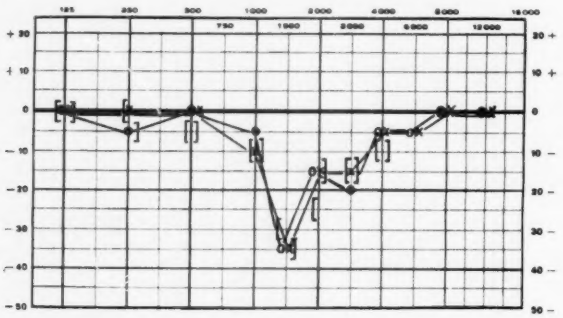

Fig. 7.—Audiogram of N. G., aged 33, who was exposed for 10 minutes to "Vampire" noise (idling).

this c^5 dip is much more limited, and its effect on the practically important hearing of conversational speech is not nearly so noxious as the pure-tone lesion of 850 cps caused by jet-propelled planes when idling. Finally, we examined with an audiometer some mechanics of the airport staff, with the following results (two examinations):

K. W., aged 42, had no hearing impairment in his family and no former ear complaint. He had been a mechanic on "Vampire" planes for four years. During the last three months he had had subjective hearing loss of both ears with no tinnitus or vertigo. Examination of the ear showed both drums unaffected. His hearing distance for whispered numbers for the right ear was 1,400 cm., and for the left ear, 900 cm.; for numbers in conversational speech, both ears, 2,100 cm. (Fig. 8).

St. V., aged 35, had no hearing impairment in his family and no former ear complaint. He had been a mechanic of "Vampire" planes for two and three-fourths years. Recently he had had subjective hearing loss. After noisy work he occasionally experienced tinnitus which declined after a certain time but no vertigo. Examination of the ear showed both drums unaffected. His hearing distance for whispered numbers for both ears was 1,300 cm.; for numbers in conversational speech, both ears, 2,100 cm. (Fig. 9)

After a comparatively short period of noisy work both mechanics complained of hearing loss. In both cases the audiogram shows a broad hearing loss which begins at 1000 and 500 cps respectively and attains its maximum between 6000 and 12000 cps. Then the curves rise again rather abruptly. Thus, in both cases the c^5 dip is absent, and the audiograms of both mechanics show that their hearing loss resembles the temporary hearing loss which a normal test person suffers from experimental exposure to a pure tone of 800 cps (Fig. 7) while listening to the noise of an idling "Vampire" for 10 minutes.

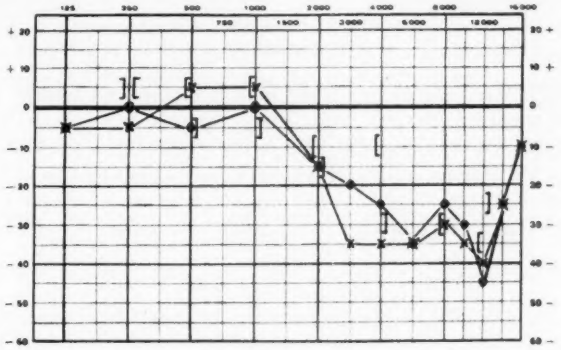

Fig. 8.—Audiogram of K. W., aged 42, who was exposed for four years to "Vampire" noise.

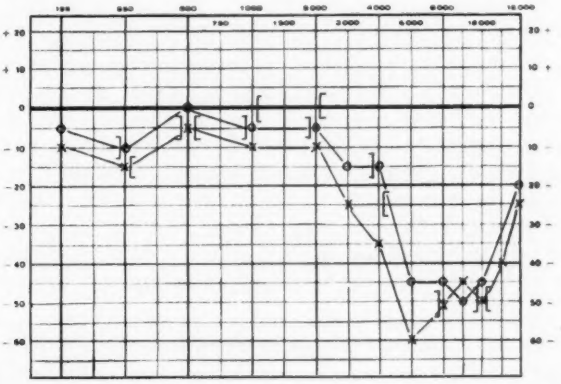

Fig. 9.—Audiogram of St. V., aged 35, who was exposed for two and three-fourths years to "Vampire" noise.

COMMENT

To prevent the gas-turbine trauma, a protective instrument with merely an effect on frequency selection is obviously insufficient, since it scarcely reduces the component of 850 cps. We consider most commendable the application of a close-fitting hard-rubber cap covering the ears, which provides a better and surer seclusion from the surrounding medium than any instrument to be introduced into the meatus. Since the noise of jet planes is so loud that hearing of speech becomes completely impossible, measures for the selection of certain frequencies important for the hearing of speech are not necessary in this particular case.

STURGE-WEBER DISEASE AS AN OTOLARYNGOLOGICAL PROBLEM

ROBERT J. McMAHON, M.D.
CHICAGO

HEMANGIOMA about the head and neck is in itself not a rarity in the field of otolaryngology. Weaver [1] recently reported three cases: In one hemangioma involved the external ear; in another, the middle ear and mastoid, while in a third it occurred in the ethmoid region. However, a case of hemangioma of the external ear, face, and pharyngeal and laryngeal mucosa of sufficient extent to become a source of respiratory obstruction is sufficiently uncommon to warrant its presentation.

LITERARY EVOLUTION OF THE DISEASE

Sturge,[2] in 1879, first described a case of an epileptiform seizure (which he attributed to a lesion of one of the vasomotor centers of the brain) in an adult having a "port-wine stain" of the face. Kalischer,[3] in 1897, first reported on the various changes in the brain of a child who had both a port-wine mark on the face and scalp and a telangiectasis of the leptomeninx. Volland,[4] in 1913, at the autopsy of a 13-year-old boy with facial nevi, demonstrated the asymmetry of the cerebral hemispheres with the pia mater as the seat of the angiomatous formations and many calcareous concretions in the underlying sclerotic atrophic cerebral cortex. Steinheil [5] was one of the first to recognize an association of meningeal angioma with another kind of congenital or developmental arterial abnormality in the brain or other parts of the body. These abnormalities he called "weak spots" in the arterial walls, and he felt that they were the occasional cause of developmental or so-called congenital aneurysms in otherwise healthy young persons. Weber,[6] in 1922, first demonstrated vascular nevi of the meninges with the aid of roentgenograms, and, in 1929,[7] he wrote concerning the association of extensive hemangiomatous nevi

From the University of Illinois College of Medicine, Department of Otolaryngology.

1. Weaver, D. F.: Three Unusual Cases of Hemangioma, Ann. Otol. Rhin. & Laryng. **52**:507, 1943.

2. Sturge, W. A.: A Case of Partial Epilepsy, Apparently Due to a Lesion of One of the Vasomotor Centers of the Brain, Tr. Clin. Soc. London **12**:162, 1879.

3. Kalischer, S.: Demonstration des Gehirns eines Kindes mit Teleangiectasie der linksseitigen Gesichts-Kopfhaut und Hirnoberflache, Berl. klin. Wchnschr. **34**:1059, 1897.

4. Volland: Ueber 2 Fälle von zerebralem Angiom nebst Bemerkungen über Hirnangiome, Ztschr. Enforsch. u. Behandl. jugendl. Schwachsinns **6**:130, 1913.

5. Steinheil, H. A.: Applied Optics, the Computation of Optical Systems, Being the "Handbuch der angewandten Optik," London, Blackie & Son, 1918-1919.

6. Weber, F. P.: Right-Sided Hemihypotrophy Resulting from Right-Sided Congenital Spastic Hemiplegia, with a Morbid Condition of the Left Side of the Brain Revealed by Radiograms, J. Neurol. & Psychopath. **3**:134, 1922.

7. Weber, F. P.: A Note on the Association of Extensive Haemangiomatous Naevus of the Skin with Cerebral (Meningeal) Haemangioma, Especially Cases of Facial Vascular Naevus with Contralateral Hemiplegia, Proc. Roy. Soc. Med. (Sect. Neurol.) **22**:25, 1929.

of the skin with cerebral (meningeal) hemangioma. Dimitri,[8] in Argentina, had described a similar condition in 1923. Lindau,[9] in 1926, associated the hemangiomatous cystic disease of the cerebellum with capillary angioma of the retina (Lindau's syndrome). Hippel [10] had previously associated retinal hemangiomatosis with facial nevi of one or more areas of the face, corresponding to the distribution of the fifth cranial nerve. Cushing and Bailey,[11] in 1928, described three cases of retinal hemangiomatosis in children (4, 5, and 8 years old) in which there were capillary nevi of the face, unilateral buphthalmus, and epileptiform convulsions. Krabbe,[12] in 1934, cited several central manifestations revealing cortical involvement in persons with facial nevi: convulsions, mental retardation, speech loss or defect, evidences of endocrine imbalance (abnormal fat deposition, underdeveloped genitalia, absence of axillary hair), and hemiplegia.

PROBLEM OF NOMENCLATURE

In reviewing the numerous articles written, all attempting to describe this syndrome of central and facial hemangiomatosis (with or without other systemic manifestations of involvement), one readily understands why the confusion of nomenclature exists. All the following names have at one time or another been used to designate this condition. Sturge-Weber disease, Sturge-Weber-Dimitri disease, Krabbe's disease, Parkes-Weber-Dimitri disease, Weber-Dimitri disease, Sturge-Kalischer disease and encephalotrigeminal angiomatosis. This collection of names still does not mention Lindau's and von Hippel's modifications and the relationship of this disease entity to congenital telangiectasis, sometimes referred to as Weber-Osler-Rendu-Goldstein disease. Sturge-Weber disease, which term I prefer for simplicity's sake, now has come to designate the triad of skin lesions, neurological findings, and roentgen signs.

PATHOGENESIS OF STURGE-WEBER DISEASE

The pathogenesis of Sturge-Weber disease appears to be a hemangiomatous formation in the layer of mesenchyme directly bordering upon the ectoderm: the skin in the cephalic region, the mucous membrane of the mouth, nose, and throat, the choroid coat of the eye, and the leptomeninges enveloping the brain. Hemangiomatosis may affect single organs or systems, such as the skin, the nervous system, and the liver, or it may be limited to a segment or region of the body, as it is in Sturge-Weber disease. In hereditary hemorrhagic telangectasia (Weber-Osler-Rendu-Goldstein disease) the angiomas and telangiectasis may be present throughout the body. Thus all these variously named manifestations of hemangiomatosis are seen to be associated basically with a hemangiomatous dysplasia of mesenchyme.

8. Dimitri, J.: Tumor cerebral congenito (angioma cavernosol), Rev. Asoc. med. argent. **36**:1029, 1923.

9. Lindau, A.: Studien über Kleinhirncysten: Bau, Pathogenese und Beziehungen zur Angiomatosis retinae, Lund, Hakan Ohlssons Boktryckeri, 1926.

10. von Hippel, E.: Die Missbildungen und angeborenen Fehler des Augens, Leipsiz, 1899.

11. Cushing, H., and Bailey, P.: Tumours Arising from the Blood Vessels of the Brain: Angiomatous Malformations and Hemangioblastomas, Springfield, Ill., Charles C Thomas, Publisher, 1928.

12. Krabbe, K. H.: Facial and Meningeal Angiomatosis Associated with Calcification of the Brain Cortex, Arch. Neurol. & Psychiat. **32**:737 (Oct.) 1934.

Lichtenstein [13] feels that the cortical concretions seen in Sturge-Weber disease are due to a disturbance in the circulation of the blood. These calcareous deposits found within the cerebral cortex (along with the frequently seen sinuous shadows of the skull as observed on x-rays) are not specific for a diagnosis of Sturge-Weber disease, for they may be found in other disorders in which interference with the arterial or venous circulation has occurred.

REPORT OF A CASE

J. P., a 9-week-old infant, entered the Research and Educational Hospital, University of Illinois, on June 17, 1950, with a three-week history of respiratory distress. The child was born at term and at the time of delivery, which was normal, small multiple hemangiomas were seen to involve the right eyelid, forehead, external ear, scalp, neck, and mucous membrane of the mouth and pharynx. Since the time of delivery, these hemangiomas had increased in size, and the parents felt they had spread in location. Three weeks prior to admission, the patient began to have respiratory distress; this was especially marked after feeding and was becoming progressively worse, despite the fact that the patient had been previously hospitalized elsewhere and had received multiple penicillin injections and a series of three irradiations of the thymus region.

Positive Physical Findings.—Large irregular cherry-red lesions of the right side of the head, face, and upper right eyelid were seen. The patient was observed to have a marked inspiratory stridor, with extensive intercostal and epigastric retractions. There were moderate moist inspiratory rales heard over the lungs bilaterally, both anteriorly and posteriorly.

Laboratory Findings.—On June 17, the urine contained a few leucocytes. Hemoglobin content was 11.2 gm. per 100 cc., the hematocrit value 35 per cent, and the white blood cells, 11,300. Wassermann and Kahn reactions were both negative. Nose and throat cultures revealed no beta hemolytic streptococci; there were many hemolytic Staphylococcus aureus organisms in the nose.

X-Ray Findings.—A lateral roentgenogram of the neck suggested a subglottic area of stenosis. Roentgenograms of the skull revealed poorly defined calcifications disclosed intracranially in the posterior parietal region on the left side. A roentgenogram of the chest revealed no evidence of pathologic conditions.

Progress and Consultations.—Therapy with humidified oxygen after admission soon resulted in a marked improvement in the patient's condition, but it was felt that a tracheotomy should be considered prior to the further investigation of the respiratory and upper pharyngeal and esophageal tracts. On June 18, direct laryngoscopy and bronchoscopy demonstrated a subglottic stenosis. When the bronchoscope was in place, the patient breathed normally and no wheezing or retractions were seen or heard. No difficulty was encountered when the tracheotomy was done with the bronchoscope in place.

The members of the department of otolaryngology felt the diagnosis of Sturge-Weber disease was a certainty in this case, and no biopsy of the subglottic stenotic area was advised. It was felt that maintenance of the airway was the important factor at this time and that after the status of the patient's intracranial condition was established a sclerosing solution might be used at a later date.

Dermatological consultation was obtained, and the consultant felt, because of the progression of the skin lesions, that treatment should be given to slow the spread. The treatment recommended was use of radium or solid carbon dioxide.

The eye consultant observed that the skin and conjunctiva of the right upper eyelid were involved with hemangiomas. The fundus of the right eye was normal. There was no suggestion of change in color or red reflex in the upper or the outer quadrant. The left eye was normal.

The conclusion of the radiation therapy consultant was that radiation to this probable subglottic hemangioma should be used only if symptoms warranted this procedure, owing to the necessity of large total skin doses (300 to 500 r) and the corresponding sensitivity of the normal skin and laryngeal structures at this age.

13. Lichtenstein, B. W., and Rosenberg, C.: Sturge-Weber-Dimitri's Disease, J. Neuropath. & Exper. Neurol. **6**:369, 1947.

The tumor clinic consultant advised treating the hemangiomas of the face with solid carbon dioxide, provided the general life expectancy of the patient was sufficient to warrant the treatment.

Fig. 1.—Cutaneous hemangioma involving right side of the face.

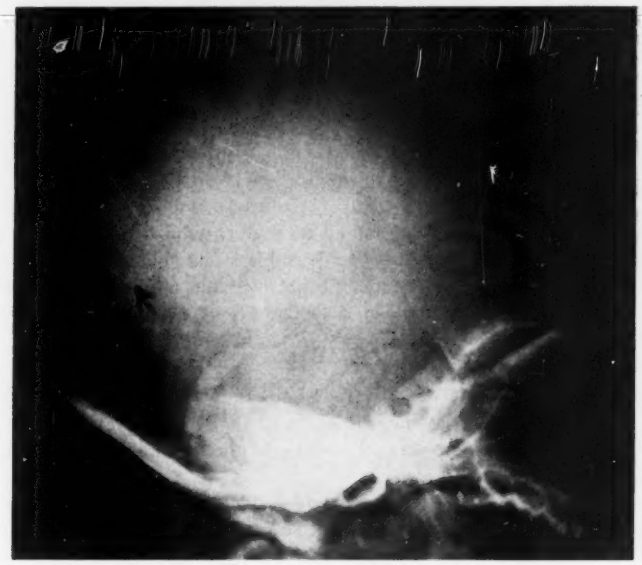

Fig. 2.—Roentgenogram of the skull. Arrows indicate sites of calcifications seen in the area of the posterior fossa.

Conclusions and Treatment.—It was felt therefore that in the light of the intracranial involvement the prognosis was poor at the very best. The airway and its maintenance was the prime consideration. The patient is to be followed at six month intervals and subsequent treatments will be given in the light of survival.

METHODS OF TREATMENT AND GENERAL COMMENT

Various methods of treatment are described in the literature. As is evidenced by this case, all methods will not be applicable to all patients, nor do all consultants agree on a single treatment in a specific case. The following modalities are most frequently mentioned as treatments of choice: (1) radiation, including x-rays, radium (plaques and needles), and radon; (2) sclerosing solutions (sodium morrhuate); (3) solid carbon dioxide, and (4) direct ligation, excision or coagulation.

The consensus is that most hemangiomas in children are best treated by irradiation. Weaver,[1] in his article, gives an excellent bibliography of the various methods of treatment. It is known that the resistance of these tumors increases with the age of the patient, and therefore the treatment of hemangioma in adults presents a different problem than does treatment of the congenital variety of hemangioma. As in the case presented, the proximity of the hemangioma to a growth center (bone or soft tissue) must of necessity be a consideration in the selection of modality to be used.

The immediate concern in the case presented was the patency of the airway. It was deemed unwise to remove a biopsy specimen from the subglottic area of stenosis because of the extreme danger of uncontrollable hemorrhage; hence it was necessary to assume that the lesion at this level must be a part of the generalized disease. It was interesting to note that at the time of the patient's previous admission the respiratory distress was felt to be on the basis of thymic compression of the trachea, and therefore the area of the thymus had received radiation. With the area of stenosis overlying the vertebral column and being relatively close to the base of the skull, it was felt that the cross firing of multiple x-ray ports might endanger nearby growth centers. Needle implantation in this area would be as dangerous as a biopsy itself, while application of a radium plaque or of solid carbon dioxide to the stenotic area was mechanically impossible in a patient of this age. Conceivably a monel metal radon applicator, similar to that employed for nasopharyngeal conditions, could be used in this infant, but only after the airway had been established below the stenotic area. Evidence of central involvement greatly alters the prognosis in this and similar cases.

SUMMARY

The literary evolution of the condition now known as Sturge-Weber disease is presented. The complexity of nomenclature is attributed to the fact that a large number of authors had all described various localized manifestations and degrees of the same condition.

The present day concept of the pathogenesis of Sturge-Weber disease appears to be that it represents a hemangiomatous dysplasia of mesenchyme.

A case of Sturge-Weber disease with laryngeal complications is presented. Various consultants gave their interpretation as to the management of this case.

Methods of treatment are enumerated. The factors of maturity of the lesion as well as location anatomically are important considerations in proper treatment.

Case Reports

NASOPHARYNGEAL FIBROMA TREATED BY UNUSUAL MEASURES

G. H. PENHA, M.D.
COIMBRA, PORTUGAL

A HEMOPHILIC patient with serious epistaxis was sent to me by a physician for treatment. One of the patient's relatives who was treated by me some years ago had shown the same affection and symptoms. Feeling utterly powerless, as the hemorrhage would not yield to routine general and local treatment, I recalled that the natives sometimes use a common plant to stop bleeding, the nettle Urtica membranacea,[1] either in infusion or by local application of the baked leaves. Lacking other resources, I tried this therapeutic measure, not only on this patient but also on another under my care who had a nasopharyngeal fibroma which bled freely. The bleeding of the hemophilic patient stopped.

So simple a treatment offering therapeutic possibilities is the object of the present investigation, and I will describe the case of the patient with nasopharyngeal fibroma as an example of its results.

The patient, G. A. P. de O., a 12-year-old boy, was seen by me for the complaint of nasal obstruction, principally on the right side, which was progressively increasing and lately had been accompanied with serious progressive hemorrhage. During rhinoscopic examination, I detected that the nasal fossa was filled with a fibrous tumor having a smooth surface and bleeding easily. Also, the right choana was filled with a pediculated tumor with the same aspect. The roentgenologic examination showed the maxillary sinus to be very opaque. On the right cheek I detected a hard tumor the size of a pigeon's egg, which made a considerable bulk in the cheek.

As the patient's anemia was progressing without any response to the therapeutic measures, I gave a transfusion of 108 cc. of blood on July 2, 1949. On July 23, I tried to perform a total resection, but succeeded in removing only a small part of the fibroma, owing to a serious hemorrhage which compelled me to stop the operation soon after it was begun.

The histopathological examination of the removed tissue by Prof. Michel Mosinger showed that "the tumor contained extensive areas of fibroblastic cells and abundant intercellular cement. Epithelial and inflammatory cells were absent." The red blood cell count showed decided anemia: hemoglobin 50% and cells 3,536,000.

From August 20 to 29, the patient underwent x-ray treatment without any benefit. He went home on October 4.

As the bleeding recurred constantly, the patient returned to me on March 1, 1950, with severe anemia. The white blood cell count, coagulation time, and bleeding time showed nothing abnormal. The anemia became worse progressively, and the patient was treated with vitamin K, ergot, posterior pituitary extract (pituitrin®), calcium and vitamin C, "coaguleno," folic acid, and liver extract. Transfusions of 250 cc. of blood were given on March 15, 22, and 23, and 460 cc. was given on April 24.

1. My first trials were made with U. membranacea, this species being more frequently found in my country. It is, however, probable that other species may also prove to be as effective as the above-mentioned.

It was while forced to give daily transfusions that I decided to give the diluted infusion and later the aqueous extract of U. membranacea.[2] The dosage for the diluted infusion was 100 cc. a two-hour period five to 10 times a day and for the aqueous extract 2 or 3 tablespoonfuls (30 to 45 cc.) a three-hour period five to six times a day. All the symptoms—viz., hemorrhage, nasopharyngeal tumor, and nodule of fibrous tissue in the cheek—subsided, surprisingly enough. The patient was allowed to go home on May 10. Recently the patient has stopped the treatment without showing any after-effects or recurrence to this date.[3]

Hoping for the same result, I decided to try this treatment for cancer. I would like to stress the fact that the results shown in certain cases encourage me to carry on further investigations, not only in cancer but also in leukemia and other diseases.

I could see from the beginning of my investigations that all tumors, even those which seem to be of the same nature, do not react in the same way to the drug. I have, for instance, another patient with nasopharyngeal fibroma who, while undergoing the treatment for two months per os, showed no response, and the tumor seemed to increase slightly in size. This fibroma, however, was not of so serious a nature as the one reported above. Lack of response led me to believe that perhaps local injections of the purified juice of the same plant [4] would give as good results in this patient as in one patient with cancer treated by me, who also showed a lack of response to the original treatment. At the end of two months of treatment, the nasopharyngeal fibroma bled for a while and then started to slough off gradually, beginning at its lower end.

To this patient, as well as to all others with malignant tumors, I began to give, in conjunction with the treatment, intramuscular injections of 2 to 3 cc. of the purified juice three times a day. I must stress that this treatment given intravenously is perfectly safe for laboratory animals and for patients.

The following active principles have been found in U. membranacea: vitamin A, formic acid, histamine, acetylcholine, and another substance not yet identified. I believe that this substance or the whole complex of active principles is responsible for the activity of the juice. The juice is perfectly harmless given either orally or intravenously. Minor reactions, such as slight rise in temperature, rigors, and pain at the site of the injections, have been detected now and then. These reactions may be attributed to either the impurity of the drug or the absorption of the sloughs of neoplastic tissue during lysis, if the following facts are taken

2. Preparation of the extract of U. membranacea involves (1) collecting the plant, (2) washing it in tanks with distilled water, (3) crushing it in a press, (4) percolating it in hot distilled water until the color is light brown, (5) decanting and filtering the fluid, (6) concentrating the fluid in a vacuum at 22 C. until it is reduced to 10% of the total weight of the plant, (7) setting the solution in a refrigerator for three days at 4 C., and (8) filtering it and adding sugar to the concentrated solution in the proportion of 35% extract to 65% sugar.

3. Unfortunately I did not secure any photograph showing the patient in his worst state, because I could not predict, at the time, the surprising effect the therapy would have on the tumor. A very recent report on this patient (July, 1951) did not describe any recurrence.

4. Preparation of the injectable juice involves (1) choice of the plant, (2) washing the plant, (3) crushing the plant and collecting the juice, (4) percolating the remnant of the plant in distilled water which is added to the juice up to the amount of 10% of the weight of the plant, (5) filtering it and leaving it to set for four days at 4 C., (6) warming the solution to 100 C. for 20 minutes, and leaving it to set for two days, and (7) filtering it and putting it into ampules which are sterilized at 100 C. for 20 minutes.

into consideration: 1. I could detect these reactions in general only several days after the injections. The reactions coincided with the active sloughing of the neoplastic tissue. 2. These reactions took place two hours after I had injected the periphery of the neoplastic tumor which was irresponsive to the treatment by mouth with 0.25 cc. of the purified juice. After 36 hours this injection brought about the complete sloughing of the exteriorized neoplastic tumor without affecting the surrounding tissue.

This study discusses only the beginning of an interesting and timely problem open to investigation. Only indispensable experimental investigation can lead us to the selection of the diseases which will respond to this treatment. I believe that the ideal way to administer the drug is by injection of the active principle.

SUMMARY

The nettle Urtica membranacea, besides its well known hemostatic action, seems to act therapeutically in certain cases of benign and malignant tumors. I have presented my first case of very serious nasopharyngeal fibroma thus treated, and I am carrying on further investigations, not only in cancer but in leukemia as well.

CALCIFIED CERVICAL NODE MASQUERADING AS FOREIGN BODY

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DAVENPORT, IOWA

A CALCIFIED cervical lymph node is a frequent enough finding that a roentgenologist, seeing one on a film of the neck, may seem surprised that an otolaryngologist does not recognize it immediately. However, it seems that one may

Fig. 1.—The arrow indicates the roentgenographically opaque shadow apparently in the trachea.

confuse it with a foreign body in the trachea or the esophagus, and it may be of value to report a case to bring this entity to general attention.

REPORT OF A CASE

On Dec. 4, 1950, P. B., a 51-year-old white man, who gave a history of having eaten pork that afternoon and having swallowed a bone, was examined. An anteroposterior roentgenogram taken at that time showed an object which appeared to be a bone. Examination otherwise showed abnormal findings. He was admitted to the hospital on Dec. 5, and an esophagoscopy was done. In the cricopharyngeal region, a whitish area was seen and an attempt made to grasp it, but nothing was brought out with the forceps. The esophagus was reentered, but

Fig. 2.—The arrow indicates the roentgenographically opaque shadow apparently in the trachea.

Fig. 3.—Diagonal view showing that the opaque shadow is anterior to the trachea.

no similar object was seen. It was felt that if a bone had been seen it might have been pushed down by the esophagoscope.

X-rays taken on Dec. 6 showed what appeared to be a foreign body in the trachea opposite the first thoracic vertebra. It was decided now that the foreign body had probably been grasped and while being removed, had slipped from the forceps into the larynx, and then down into the trachea.

On Dec. 7, a bronchoscopy was done, but no foreign body was found. On Dec. 9, lateral and diagonal x-rays showed no change. In the meanwhile the patient became entirely asymptomatic. At no time had there been any dyspnea as one might have expected to result from the presence of a tracheal foreign body.

After restudy of the diagonal film, it was finally decided that the shadow was entirely outside the trachea and was a calcified cervical node. The accompanying plates show how the node can be confused with a foreign body and how study of the oblique x-ray shows that the object is in front of the trachea.

SUMMARY

A case is presented in which a calcified cervical node in a patient who gave a history of swallowing a bone was mistaken for a foreign body in the esophagus and in the trachea.

1820 W. 3rd St.

Clinical Notes; New Instruments, and Techniques

CRICOTHYROID SUBLUXATION

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CLEVELAND

Pain on swallowing is one of the most frequently encountered symptoms in medical practice. In searching for the cause of such pain I have on some occasions been led to the larynx as the site of the causative agent. The patients to be discussed are noteworthy in that none showed acute or chronic inflammatory changes, there being no evident tuberculosis, ulceration, tumor, or other visible local change in the larynx which might well be the cause of pain.

Eight patients presented histories and findings so nearly identical that they will be considered together. All stated that they were perfectly well until a sudden sneeze, lusty yawn, or sudden turn of the head occurred. There followed a sharp pain when swallowing, the pain centering in the larynx and sometimes referred to the ear. There was a feeling of a lump in the throat. With each swallow the pain was sharp and severe and resulted in attempts by the patients to keep from swallowing because of the pain. Palpation of the laryngeal skeleton revealed a grating sound and feeling evident to both patient and examiner when the thyroid cartilage was moved in relation to the cricoid. Firm pressure on the thyroid cartilage resulted in a sharp cracking sound and feeling, with a permanent movement of the thyroid cartilage to a fixed position medial to that found before manipulation. The displacement occurred either to the right or the left. After this manipulation the patients experienced dramatic relief of the pain, swallowing easily and with complete comfort. Occasionally there was a residual dull ache lasting one or two hours in instances in which the difficulty had been present for several days.

In following these patients for periods ranging from several months to 15 years it is noted that in some there are frequent recurrences. In three patients who were seen with recurrences, anesthesia of the superior laryngeal nerve was performed. This also resulted in complete relief of pain for the duration of the anesthesia. Longer-lasting relief was obtained by the manipulative procedure described above. Patients can readily be taught to apply pressure to the larynx themselves, reducing the displacement immediately when symptoms are first noted.

This would seem to be a subluxation of the inferior cornu of the thyroid cartilage at the cricothyroid joint. Description of such a subluxation was not seen in the literature or standard textbooks.

10300 Carnegie Ave. (6).

NEW RIGHT-ANGLE OTOSCOPE

Facilitating Differential Diagnosis in Tympanic Pathology

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SAN FRANCISCO

Fluid in the middle ear is a pathological condition induced by various etiological factors and recognized by a pathognomonic pattern of diagnostic signs and symptoms. It is not a new clinical entity, having been described in the literature, by diverse terms, however, for the past 50 years or more.

As an illustration of the confusion in terminology, Politzer [1] described this condition as seromucous catarrh of the middle ear, otitis media serosa, exudative catarrh, and catarrh of the tympanic cavity and Eustachian tube. Kerrison [2] referred to it as an acute serous otitis media, while more recently, to mention only a few of the many writers on this subject, Tobey [3] called it acute catarrhal otitis media with effusion and Jordan [4] alluded to it as chronic secretory otitis media. According to Hoople [5] it is otitis media with effusion, while Armstrong [6] described the condition, when incurred in air flight, as an acute aero-otitis media. Trowbridge [7] admitted, however, that the same pathology as in aero-otitis media may be observed in acute and subacute catarrhal otitis media, secretory catarrh, and serous otitis media.

Barnes [8] preferred the term secretory otitis media to otitis media with effusion, since the former is but one condition in which fluid is present in the middle ear. The latter, he felt, should properly be classified under the general term of hydrotympanum. He made the pertinent observation that differentiation between the various possible causes of hydrotympanum is not merely of diagnostic importance but at the same time constitutes the basis for effective management of the condition. In the discussion of Barnes's paper, McNaught [9] dissented from the use of the term secretory otitis media, since it implies an active process and would rule out transudates which are certainly not secretory. His choice of a better general term was serous otitis.

Hoople [5] succinctly stated that there are two types of fluid which may fill the middle ear. The first is a transudate and is thin and serous in character, while the second type is an exudate, mucous in character but when present usually mixed with the serous transudate. The etiological factor is a negative pressure in the middle ear induced mainly by pathological conditions of the nasopharynx.

It is plausible to assume, therefore, that the earliest stages of the disease are associated with an effusion of serum into the middle ear, remembering that the lining membrane of the tympanum is exceedingly thin, contains no acinous glands, and is devoid of cilia except for the floor. The degree to which mucus is present is indicated by the mucosal response to the inflammation. Thus

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1. Politzer, A.: Diseases of the Ear, revised by M. J. Ballin and C. L. Heller, ed. 4, Philadelphia, Lea Bros. & Co., 1903.

2. Kerrison, P. D.: Diseases of the Ear, ed. 3, Philadelphia, J. B. Lippincott Company, 1923.

3. Tobey, H. G.: Acute Catarrhal Otitis Media with Effusion, Tr. Am. Otol. Soc. **36**:51-71, 1948.

4. Jordan, R.: Chronic Secretory Otitis Media, Laryngoscope **59**:1002-1015 (Sept.) 1949.

5. Hoople, G. D.: Otitis Media with Effusion, Tr. Am. Acad. Ophth. & Otolaryng., pp. 531-541, May-June, 1950.

6. Armstrong, H. G.: Principles and Practice of Aviation Medicine, Baltimore, William Wood & Company, 1939.

7. Trowbridge, B. C.: A New Treatment of Acute Aero-Otitis Media, Arch. Otolaryng. **50**:255-263 (Sept.) 1949.

8. Barnes, L. J.: Secretory Otitis Media, Tr. Pacific Coast Oto-Ophth. Soc., pp. 79-88, 1950.

9. McNaught, R. C., in discussion on Barnes.[8]

it can be understood that as the negative pressure persists in the middle ear, a physiological response is made to fill the void by an outpouring of mucus from the Eustachian tube, bearing in mind that the latter is lined by several layers of ciliated epithelium and contains many acinous glands. The effect of this outpouring of mucus is to produce a neutralization of the pressure differential up to a certain point, beyond which pressure symptoms arise.

The accepted treatment of this condition, when tubal inflation failed to be of benefit, has been myringotomy. But at times, in recalcitrant cases, multiple myringotomies have been performed with the resultant hazard of a chronic adhesive process due to the accumulation of blood and fibrin in the middle ear.

Trowbridge [7] advocates the removal of serous fluid from the tympanic cavity by means of aspiration with a tuberculin syringe and needle. Certainly, this method would not apply when the tympanic contents are of a mucous character, in which event myringotomy would be required. However, it would be desirable to ascertain in a given case, in advance, which method of evacuation of fluid contents of the middle ear would be indicated.

It was with this purpose in mind that I devised the right-angle otoscope. It consists of the conventional electric distally illuminated magnifying otoscope modified by the removal of the lens head and the substitution of a separate, movable elbow-shaped compartment. This compartment has two apertures, one closed by the original lens which is placed at an angle of 90 degrees from its original location, the other aperture patent for insertion into the barrel of the otoscope proper (as shown in Fig. 1). On the inside wall, between the two apertures, is

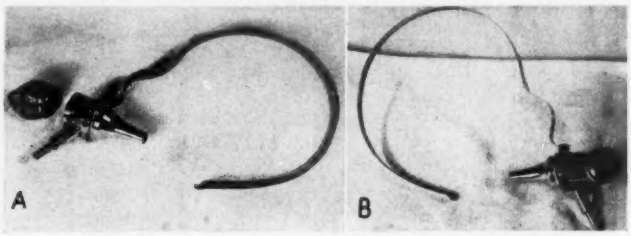


Fig. 1.—*A*, right-angle otoscope, disarticulated, showing the separate movable elbow-shaped compartment. The magnifying lens is on its left, and just to the right is the patent aperture for insertion into the barrel of the otoscope proper. The reflecting surface between the lens and patent aperture is not illustrated. The remainder of the otoscope is the conventional electric otoscope with hollow attachment for auscultation tube and solid attachment for electric cord. A thin, flexible steel headband is attached to the upper surface of the otoscope by a movable pivot to permit right or left application. Rotation of the elbow-shaped compartment permits bringing the lens forward to face the examiner when either ear is being observed. *B*, right-angle otoscope assembled (auscultation tube and electric cord not illustrated).

placed a reflecting surface at a 45-degree angle from the lens and also at a 45-degree angle from the aperture leading to the ear speculum.

The same otoscope may be utilized for either the right or the left ear. It is so constructed that it is a simple matter to adjust the lens (to face the examiner) when transferring the otoscope from one ear to the other merely by rotating the movable elbow-shaped compartment containing the lens a full 180 degrees on its axis. While a thin, flexible, steel headband holds the otoscope in place, it may at times be of some assistance if the patient, in addition, holds the otoscope tightly to his ear, since the direction of the canal wall may vary from patient to patient. The headband can also be swung around its swivel, which is pivoted to the otoscope, in a half circle to allow for proper placement of the instrument against either side of the head.

On the under surface of the otoscope is the usual hollow attachment for a rubber bulb, but in this instance the hollow attachment is connected to the auscultation tube which permits the examiner to hear the sounds which may come through on insufflation. When the otoscope is placed in the patient's ear and illuminated distally, the examiner (seated in front of the patient, face to face) may view the drum membrane and observe the effect of insufflation per catheter (performed by himself) on the membrane while, at the same instant, via the auscultation tube, he is enabled to distinguish the character of the sounds coming through.

Thus, with serous contents in the middle ear, bubbling rales are heard via the auscultation tube, while bubbles of air are observed upon the inner surface of the membrana tensa. The fluid level and air bubbles, when present, alter their position on repeated inflation. When the tympanic contents are mainly of a mucous character, the sounds are not so distinctly gurgling in effect but seem heavier or rougher in consistency, while visually the air bubbles are not so apt to be present or float around so easily (upon inflation per catheter) as in a medium of lighter specific gravity. When the tympanum is filled with fluid with no fluid level visible, there is no fluid sound but the drum membrane appears darker, wrinkled, parchment-like, and flaccid and appears to bulge outward with each gentle puff of air per catheter. These signs and findings are not always present but when present should always be regarded in their true perspective as relative and not absolute, and correlation with the history and clinical findings is essential.

Ideally, the indicated therapy would be aspiration with a needle when the fluid contents are assumed to be thin and serous in character and, conversely, myringotomy would be required when the middle ear contents are presumed to be mainly mucous and thick in consistency. In effect, the right-angle otoscope is intended as an aid to the differential diagnosis of the character of the fluid contents of the middle ear with the purpose of indicating the appropriate therapy, i. e., aspiration versus myringotomy.

Fig. 2.—*A*, right-angle otoscope, ready for use, placed in left ear, showing attachment of auscultation tube and electric cord, with Eustachian catheter in left nasal passage. The flexible headband (not seen because of patient's hair) holds the instrument in place. *B*, right-angle otoscope, placed in right ear, showing how rotation of the elbow-shaped compartment on its axis of a full 180 degrees brings the lens forward to face the examiner. Since the external auditory canal may vary in its direction, it is also illustrated how a patient may at times assist in holding the instrument tightly in the canal so as to permit adequate visualization of the drum membrane.

A collateral application of the right-angle otoscope may be utilization in the differential diagnosis of pathological conditions of the tympanic membrane itself. According to my description[10] while I was with an armed forces induction board in 1944 and 1945, the magnifying otoscope was of material assistance on this point. But when the auscultation tube is used simultaneously, as in the instrument at present described, the combination of the visual and auditory senses doubles the examiner's perceptive acuity. Thus, in the presence of a perforation in a suppurative ear, the examiner not only hears the perforation whistle but he simultaneously sees the discharge expelled through the perforation into the canal. Further inflation may produce air bubbles in the discharge or in the fluid contents of the canal.

10. Gidoll, S. H.: Ear, Nose and Throat Defects in Selective Service Examinations, Eye, Ear, Nose & Throat Month. **23**:177-185 (May) 1944.

A cicatrix (perforation healed by thin scar tissue) is usually very transparent and may look like a dry perforation. Unless it is adherent to the promontory it can readily be distinguished from a perforation by the absence of the perforation whistle upon insufflation and by the presence of a snapping sound caused by the flapping in and out of the atrophic scar tissue. Visually, the nippling in and out of the healed perforation occurs simultaneously with each puff of air per catheter.

SUMMARY

The treatment of the pathological entity caused by fluid in the middle ear is determined by the degree of viscosity of the fluid. When more conservative methods fail, aspiration per needle and syringe is indicated when the fluid is thin and serous while myringotomy is required when the middle ear contents are thick and mucoid.

It was for the purpose of assisting in the diagnostic differentiation of the consistency of the fluid that a right-angle otoscope was devised. This otoscope permits the simultaneous utilization of the examiner's visual and auditory senses, thus doubling his perceptive acuity and discrimination. The right-angle otoscope is described in detail.

Mr. J. D. Brower of Parsons Optical Laboratories, 518 Powell St., San Francisco, was responsible for translating my basic ideas into the above-described otoscope and constructing it and also for the accompanying photographs.

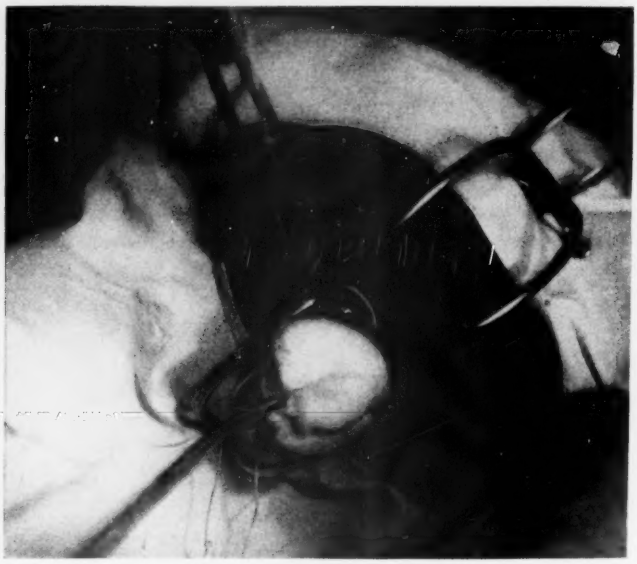
516 Sutter St. (2).

TECHNIQUE IN USE OF POSTERIOR NASAL PACK

C. B. TURNBLACER, M.D.
PITTSBURGH

It is not my purpose to discuss the conditions in which the posterior nasal plug is indicated but merely to illustrate a variation in technique that has proved beneficial both to the patient and to the surgeon. So far as can be ascertained, this variation has not been described previously.

All those engaged in the practice of otorhinolaryngology have at one time or another been forced to resort to the use of the posterior nasal pack in the control of hemorrhage. In many



Details of technique.

instances the pack is inserted at the time of surgery while the patient is still on the operating table under general anesthesia. At other times the plug is inserted with the patient fully conscious of the procedure and suffering the utmost discomfort, as well as apprehension, due to the hemorrhage.

All surgeons have used the soft rubber urethral catheter as a guide to recover the looped cord of a postnasal pack from the pharynx, then applied traction on the loop to draw the pack into the nasopharynx and to seat it firmly. This procedure has certain disadvantages, such as inversion of the uvula and soft palate, trauma to the posterior pillars, and occasionally a tear in the posterior pillars due to this trauma, which leaves an asymmetry in the pillars distasteful both to the surgeon and, later, to the patient when he has an opportunity to inspect it. To avoid this, a palate retractor, which frequently is not part of the routine instrument setup, is used. In cases in which this must be sterilized after the need for it arises, a prolonga-

Fellow in Otolaryngology, Eye and Ear Hospital, University of Pittsburgh Medical Center.

tion of anesthesia time is necessitated. A second catheter can be used as a retractor by inserting it through the nostril not already employed, but in some instances this second catheter is not instantly available.

The technique that I have found helpful is quickly gleaned from the accompanying illustration. A single catheter together with other instruments normally found in the standard setup are all that are required. The loop of the posterior nasal plug is fixed in the conventional manner to the rubber catheter guide. Both ends of the catheter are now grasped, and the catheter becomes a palatal retractor as well as a guide. The posterior nasal plug, which has been wedged and shaped, is grasped by the free edges with an available curved hemostat of the type commonly used by the surgeon and introduced beneath the retracted soft palate, where in most instances it can be seated under direct vision. The catheter is at this point drawn through and the loop anchored in the usual manner. This technique is offered because it has been found to avert inversion of the uvula and soft palate and traumatization of the posterior pillars. It also eliminates delay, thereby reducing anesthesia time. It is readily adaptable to local anesthetic use as well, preventing the closure of the nasopharynx due to gagging when the plug becomes lodged in the posterior pharynx and digital manipulation is required to seat it.

340 N. Main Street.

Progress in Otolaryngology

Summaries of the Bibliographic Material Available in the Field of Otolaryngology

PLASTIC SURGERY DURING THE YEARS 1949 AND 1950

LYNDON A. PEER, M.D.
JOHN C. WALKER Jr., M.D.
AND
F. ANTHONY MARZONI, M.D.
NEWARK, N. J.

THE LITERATURE during 1949 and 1950 contains many contributions of interest for otolaryngologists doing facial plastic surgery.

One notes with satisfaction that there is an absence of articles advocating complete removal of the nasal septum, based on the theory that the septum does not provide support for the dorsum of the nose. When this theory, which was dangerous and unsound, was followed, it resulted in a large number of saddle nose deformities. A modification of the principle is still advocated in which a straight piece of septal cartilage is inserted between the mucoperichondrial flaps to provide support for the dorsal line of the nose. This is an old procedure, which is valuable in selected cases, but its use by the occasional operator is not advisable.

There is also an absence of articles advising extensive or complete removal of the nasal septum in growing children, either alone or with a rhinoplasty. This also is a dangerous procedure, which results in "stunting" or retarding the normal growth and development of the nose.

It is gratifying to feel that the editorials appearing in this review may have had some effect in silencing the proponents of these unsound doctrines.

EDITORIAL COMMENT ON CURRENT TRENDS IN PLASTIC SURGERY

Unsuccessful Rhinoplasties.—During the past few years we have made a special study of 100 cases in which the patients had undergone nasal plastic procedures but were dissatisfied with the postoperative results. These patients were classified as follows: (1) definite psychopathic personalities, with good cosmetic results, 20%; (2) persons with obstructed breathing, with good cosmetic results, 15%, and (3) persons with inadequate correction of the cosmetic deformity, with or without obstructed breathing, 65%.

Definite Psychopathic Personalities: This group of 20 patients had acceptable cosmetic correction of their deformity but were vaguely or actively dissatisfied. All patients in this group being psychopathic to some degree, our management was to praise the work of the surgeon who had performed the rhinoplasty and suggest that they return to him for a discussion of their problem. When this approach was unsuccessful, we recommended a compromise attitude toward their desire for perfection and sent them to a psychiatrist. Many of these patients were operated on elsewhere, but they returned more dissatisfied than before the secondary operation.

Persons with Obstructed Breathing and Good Cosmetic Result: This group of 15 patients all had satisfactory correction of their nasal deformity, but they com-

plained of inability to breathe through the nose. Many stated that the obstructed breathing was more pronounced after operation than it had been before operation.

Examination of this group demonstrated that the obstruction was due to a deflected septum which had not been corrected or was inadequately corrected or due to hypertrophied inferior turbinates or a displacement of the anterior free border of the septal cartilage. The patients who were operated on to correct the obstructed breathing showed satisfactory results.

Persons with Inadequate Correction of Nasal Deformity With or Without Obstructed Breathing: In this group, which comprised 65% of our patients, the complaints were as follows: obstructed breathing, displacement of the bony bridge to one side of the face; saddle nose deformity; high ridge of bone in the glabellar region, often associated with a rounded elevation above the nasal tip, and a snubbed short nose with notched alae and deep depressions on the lateral aspects of the alae. A number of patients complained that the nose was too low, which made the face appear flat.

We operated on all patients in this group who were willing to accept a reasonable degree of improvement but no assurance of a perfect nose, and all were benefited to varying degrees.

The most difficult nose to correct was the "overoperated" nose with a snubbed tip and notched alae.

The senior member of this department feels very strongly that the surgeon doing a rhinoplasty should always avoid overcorrection of the nose. A number of small and annoying complications may occasionally occur after a conservative and sound nasoplasty, but these can later be successfully corrected at the office by small adjustment procedures. (About 5% of our own patients require this adjustment.) In the case of an "overoperated" nose it may not be possible to obtain a satisfactory result by means of a secondary operation.

Foreign Implants.—Articles continue to appear in the literature advising the use of foreign substances to fill depressions in the nose, face, skull, and breasts and to provide structural support for reconstructed auricles. Although some of these foreign implants remain in place for varying lengths of time, there is a general tendency toward extrusion of the foreign body, associated with considerable scar formation and an increase in the patient's deformity.

Dissatisfied patients may institute a lawsuit on the grounds of malpractice, and in such cases it has been difficult for the defending attorney to establish the fact that his client exercised good surgical judgment in using a foreign body implant instead of an autogenous tissue graft.

On the basis of the known facts at the present time, the surgeon should use autogenous grafts to fill depressions. A good general rule is to select a graft that duplicates the particular tissue which is deficient; thus bone grafts are used for bony defects, cartilage grafts for cartilaginous defects, and fat or fat-dermal grafts for fatty losses. Large muscle losses must be replaced by fat-dermal grafts, because free muscle grafts are always converted into fibrous tissue, which is greatly reduced in size.

Under certain conditions preserved cadaver cartilage may be used instead of autogenous cartilage, and foreign bodies such as tantalum, vitallium, and stainless steel may be employed as sutures or for temporary supports as in bony losses of the mandible and as ear molds for diced cartilage grafts.

Complete Reconstruction of the Auricle.—A number of articles have been published during the past two years advocating various new methods or modifications of older procedures to reconstruct the external ear. Most of these papers should be considered as case reports, since the procedures advised have been used in one case, a case and a half, or, in some instances, in an unfinished case. Many of the techniques advised lack simplicity, and some are impractical. Other contributions give an impression that the author's method is quite satisfactory but that the methods of other surgeons, who are not mentioned by name, are quite hopeless and unsatisfactory.

An objective comment on all these articles is that the problem of total ear reconstruction should be approached with great respect and that new procedures should not be reported until they have been used for at least five total ear reconstructions.

No method for building an auricle is completely satisfactory to the critical surgeon at this time. One might also add that since every surgeon is using the ideas of other men when he reconstructs an auricle, a certain amount of humility is therefore indicated; the Esser inlay, the successful transplantation of autogenous cartilage, the preservation and transplantation of cadaver cartilage, the occasional use of local or migrated skin flaps, and the taking advantage of the tendency of cartilage to curl are all ideas of other men, living and dead. Surgical originality often consists in putting the ideas of other men together in workable arrangement in order to obtain a specific result. Very few plastic surgeons have accomplished this for total ear reconstruction in consecutive cases.

Successful total ear reconstruction appears to depend more on the experience of the surgeon than on the particular technique which is used for the reconstruction. We have seen good auricles reconstructed by a small number of plastic surgeons using different variations of the basic technique as described by Esser. All these men, however, had a large experience in auricular reconstruction before they succeeded in making relatively good ears.

Complete auricle reconstruction is certainly not a good field of work for the beginner.

Fig. 1.—*A*, incision 20 to 25 mm. long through the skin and orbicularis. A horn plate is used to support the lid, while the skin and orbicularis are reflected down to the cilia. The incision through the conjunctiva above the tarsus can be seen behind the scissors. *B*, traction suture passed through the limbus to pull the globe down and incision made through the conjunctiva over the insertion of the superior rectus muscle. *C*, superior rectus exposed and freed from Tenon's capsule 6 to 10 mm., care being taken not to sever the reflected tendon of the superior oblique muscle which lies directly under it. *D*, three double-armed atraumatic 4 to 0 plain absorbable surgical sutures passed through the lateral, the middle, and the medial thirds of the superior rectus tendon 2 or 3 mm. from its insertion and tied, leaving 2 mm. of tendon anterior to each knot. This may be done with or without the aid of a muscle clamp. If a muscle clamp is used in resecting the superior rectus, it is more convenient to place these sutures after the muscle has been resected. *E*, after severing the superior rectus from the globe (with or without the aid of a muscle clamp) two double-armed 4 to 0 chromic absorbable surgical sutures are passed first through the lower lip of the conjunctiva, then through the muscle stump attached to the sclera, then through the superior rectus at the proper height, and finally through the upper lip of the conjunctiva and tied. (It can be noted that the tendon of the superior oblique is under the superior rectus.) *F*, the two double-armed chromic sutures tied, leaving exposed the three tongues of the superior rectus muscle. *G*, the three tongues of the superior rectus muscle pulled forward through the previously made incision in the conjunctiva to the anterior surface of the tarsus. *H*, the three tongues of the superior rectus spread out on the anterior surface of the tarsus and the three double-armed sutures passed through the gray line of the upper lid so that each set of sutures is 5 or 6 mm. apart. (Berke,[1e] pp. 502-503.)

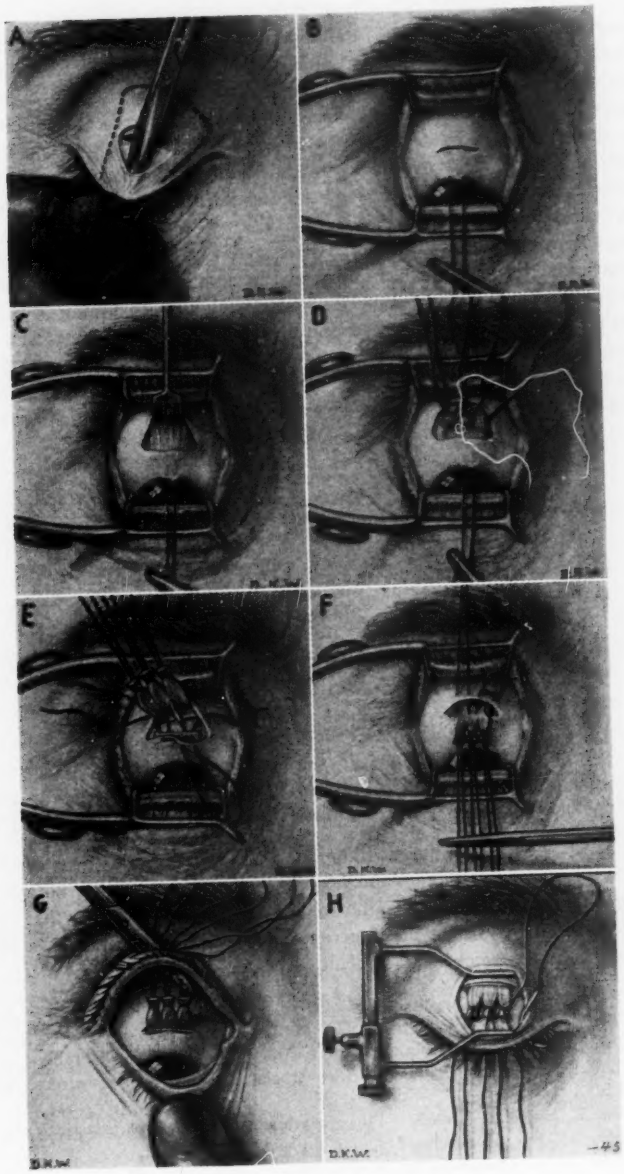


Figure 1

(See legends on opposite page)

EYE

Three important articles on ptosis appeared in 1949 by Berke,[1] of the Institute of Ophthalmology, Presbyterian Hospital, New York. He describes the Motais-Parinaud type of operation, which should be reserved for cases of ptosis in which the levator muscle is completely paralyzed and the superior rectus muscle is active. He found that hypotropia developed in 15% of the patients on whom this type of operation was done. He advocates a modification of this procedure, in which the superior rectus muscle is shortened (retaining its lifting power) and a section is sutured to the upper lid (Fig. 1).

For performing a blepharoplasty, Farina and Piza [2] usually prefer the Wiener-Lexer technique,[3] in which a thin strip of fascia is used to unite the lid with the fascia of the frontalis muscle. Steckler [4] advises the use of a sling of fascia which is placed under the superior rectus tendon to support the ptosed lid, as first described by Dickey.

In a well-illustrated article, Figi [5] presents an interesting method for reconstructing the inner or outer canthus and the palpebral fissure with a small forehead

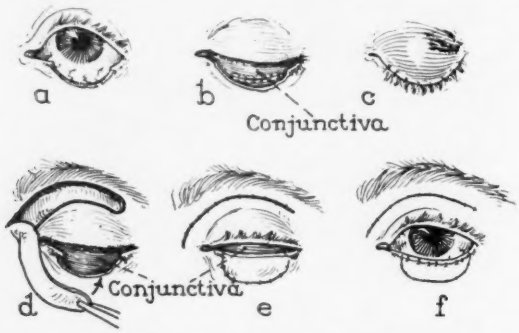


Fig. 2.—Dupuy Dutemps method of reconstructing the eyelid by utilizing the conjunctiva, tarsus, and a skin flap from the normal lid (Figi [5]).

flap (Fig. 2). The use of adjacent tissue for plastic surgery about the eye whenever possible is advised by Lamont [6] and Marcks.[7] The latter adds a note of caution regarding the transfer of flaps, after removal of malignant growths: one must be satisfied that there will be no recurrence, since after application of a heavy flap observation becomes exceedingly difficult.

1. Berke, R. N.: (*a*) Congenital Ptosis, Arch. Ophth. **41**:188 (Feb.) 1949; (*b*) Motais-Parinaud Type of Operation for Ptosis, ibid. **41**:324 (March) 1949; (*c*) An Operation for Ptosis Utilizing the Superior Rectus Muscle, Tr. Am. Acad. Ophth., p. 499, May-June, 1949.

2. Farina, R., and Piza, P. de T.: Blepharoplasty, Plast. & Reconstruct. Surg. **5**:97 (Jan.) 1950.

3. Farina, R., and Piza, P. de T.: Ptose palpebral (blepharoplastia pela técnica de Wiener-Lexer modificada), Rev. Hosp. clín. **4**:9 (Jan.) 1949.

4. Steckler, M. I.: Operations for Blepharoptosis, Arch. Ophth. **42**:283 (Sept.) 1949.

5. Figi, F. A.: Plastic Surgery of the Eyelids, Plast. & Reconstruct. Surg. **5**:403 (May) 1950.

6. Lamont, E. S.: Plastic Surgery About the Eye, Am. J. Surg. **79**:824 (June) 1950.

7. Marcks, K. H.: Repair of Defects Produced by Excision of Tumors in the Eye Region, Plast. & Reconstruct. Surg. **4**:178 (March) 1949.

To correct cicatricial ectropion, Ulloa,[8] of México, D. F., removes the fibrous tissue and stretches the defect to twice the necessary size. The defect is then covered with a split graft, and a cephalic traction bar is used to keep the necessary tension.

A method for correcting a severe burn defect in the region of the eyelid is described by Scarborough and Landers.[9] This was done in seven operations over a period of 13 months.

In considering the reconstruction of the canthi, Callahan[10] emphasizes that severe injuries to the palpebral ligaments, complicated by fractures of the orbital rim, are responsible for major deformities, displacements of the canthi, and avulsion of the eyelids. He was unsuccessful in achieving the desired improvement by methods in general use; so he utilized bone rather than periosteum for support, and wire of an inert nature in preference to nonabsorbable or absorbable surgical sutures. Stainless steel wire (0.009 in. [0.0023 cm.]) was found most useful. There is an interesting discussion of this subject by Wendell L. Hughes and Sidney A. Fox.

Results of early treatment of congenital anophthalmos are reported by Kiskadden, McDowell, and Keiser.[11] They suggest a method of progressive dilation first described, in the Russian literature, in 1931. The authors stress that treatment must be begun in early infancy and that the fitting of acrylic resin forms must be carried out frequently.

Metallic implants and integrated artificial eyes are evaluated by Hughes.[12] The implants are made of hollow vitallium and have attachments whereby the extraocular muscles can be sutured into the implant.

Stetson[13] discusses 301 cases of carcinoma of the eyelid in which treatment was given by the roentgenographic department of the Massachusetts General Hospital. The lower lid was found to be the most frequent site of involvement and the inner canthus the next. The facility of treatment by irradiation and the excellent cosmetic and functional results that usually follow make it, as a rule, the treatment of choice.

(*Comment.*—The members of this department always prefer radical excision of basal and squamous-cell carcinoma of the eyelids rather than irradiation therapy. Irradiation treatment is used only in late extensive cases in which operative removal would not effect a cure or for older patients, with a short life-span expectancy.)

In an excellent paper, Reeh and Swan[14] state that the incidence of epithelial cancers of the lids seems considerably greater than statistics compiled by pathologists have indicated. They point out that surgeons should have the cooperation of the ophthalmologist.

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8. Ulloa, M. G.: Correction of Cicatricial Ectropion by Means of a Skin Graft Placed over an Artificially Hyperdistended Area, Plast. & Reconstruct. Surg. **5**:310 (April) 1950.

9. Scarborough, C. P., and Landers, P. H.: Plastic Socket and Lid Reconstruction, Am. J. Ophth. **33**:1269 (Aug.) 1950.

10. Callahan, A.: Reconstruction of the Canthi, Tr. Am. Acad. Ophth. (Oct.) 1947; Arch. Ophth. **43**:174 (Jan.) 1950.

11. Kiskadden, W. S.; McDowell, A. J., and Keiser, T.: Results of Early Treatment of Congenital Anophthalmos, Plast. & Reconstruct. Surg. **4**:429 (Sept.) 1949.

12. Hughes, W. L.: Metallic Implants and Integrated Artificial Eyes, Plast. & Reconstruct. Surg. **4**:175 (March) 1949.

13. Stetson, C. G., and Schulz, M. D.: Carcinoma of the Eyelid: Analysis of Cases and Review of the Literature, New England J. Med. **241**:725 (Nov. 10) 1949.

14. Reeh, M. J., and Swan, K. C.: Experiences with Tumors of the Lid, Tr. Am. Acad. Ophth., p. 312, March-April, 1950.

EAR

Blake,[15] of England, writes of having prepared four autogenous ear cartilages, using "flakes" of cartilage in a perforated mould for total ear reconstruction. He discovered later that Peer and Aufricht had considerably preceded him. Blake has now completed seven ears and is encouraged to continue using the method.

To reconstruct the external ear Converse[16] uses autogenous rib cartilage for the helix and iliac bone for the concha. These are refrigerated and shaped at leisure. He states that he has achieved reconstruction in two to three operations over a period of three to six months.

(*Comment.*—The surgeon always has difficulty in obtaining a sufficiently deep concha for a reconstructed auricle in the trimming operations. Often it is advantageous to remove all of the cartilage framework in this location down to the mastoid bone or in some cases even drill a depression in the mastoid bone to create the impression of depth. The bone graft used by Converse in the conchal region instead of cartilage would therefore serve as a temporary support; later it would probably be removed in an effort to create a deep concha.)

To restore the missing ear Byars and DeMere[17] split a large piece of cartilage, depending on its natural "curl" for the desired prominence.

(*Comment.*—On the basis of the photographs in the article the authors have obtained good average results. They have succeeded in obtaining these results, however, in fewer operative steps, and for this they should be commended. Many of the principles utilized are similar to those in Barrett Brown's technique, as seen by a member of this department at the Valley Forge General Hospital at Phoenixville, Pa. Brown's results were exceptionally good considering the few operative steps used to construct a complete auricle.)

In forming the helix, Lewin[18] prefers a postauricular flap. McNichol[19] uses a tubed pedicle from the neck for total helix reconstruction. The latter's measurements may prove of value to anyone using this type of reconstruction.

Wynn describes a method of ear lobe reconstruction which, in reality, is a sliding flap from the postauricular and mastoid region.

A complete review of the correction of abnormally protruding ears is presented by Becker.[21] He describes the type of operation he prefers, which is an elaboration of George Warren Pierce's method in which a central segment of cartilage is

15. Blake, H. E.: Prefabricated Autogenous Ear Cartilages, Brit. J. Plast. Surg. **1**:220 (Jan.) 1949.

16. Converse, J. M.: Reconstruction of the External Ear by Prefabricated Framework of Refrigerated Bone and Cartilage, Plast. & Reconstruct. Surg. **5**:148 (Feb.) 1950.

17. Byars, L. T., and DeMere, M.: Restoration of the Missing Ear, Plast. & Reconstruct. Surg. **5**:66 (Jan.) 1950.

18. Lewin, M. L.: Formation of the Helix with a Postauricular Flap, Plast. & Reconstruct. Surg. **5**:432 (May) 1950.

19. McNichol, J. W.: Total Helix Reconstruction with Tubed Pedicles Following Loss by Burns, Plast. & Reconstruct. Surg. **6**:373 (Nov.) 1950.

20. Wynn, S. K.: One-Stage Ear Lobe Reconstruction, Plast. & Reconstruct. Surg. **4**:105 (Jan.) 1949.

21. Becker, O. J.: Surgical Correction of the Abnormally Protruding Ear, Arch. Otolaryng. **50**:541 (Nov.) 1950.

removed to create a new antihelix. Brown [22] gives the established technique for correcting protruding ears. He, however, makes what is considered a relatively simple procedure appear difficult by using latex models to practice on preoperatively.

A comprehensive review of the literature on hemangioma of the ear and mastoid region has been made by Valentine Miller.[23] He stresses that each lesion in these areas must be approached differently.

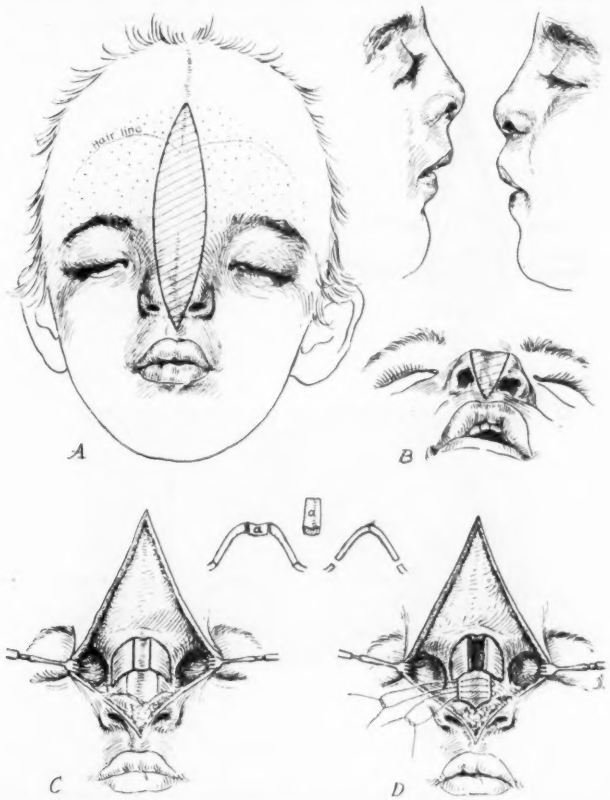

Fig. 3.—*A* and B, amount of skin and subcutaneous tissue excised and *a*, excision of nasal bones. *C* and *D*, division of the nasal processes of the maxilla and the bifurcated septum. (Webster and Deming,[26] pp. 26-27.)

The problem of malignant melanoma of the external ear is well presented by Sylvan and Hamberger,[24] of Göteborg, Sweden, who report 56 cases. The authors advise more radical and earlier surgical intervention.

22. Brown, A. M.: Protruding Ears: Plastic Correction; Planning Technic; Operation. Arch. Otolaryng. **47**:809 (June) 1948.

23. Miller, M. V.: Hemangioma of the Ear and Mastoid Process, Arch. Otolaryng. **49**:535 (May) 1949.

24. Sylvan, B., and Hamberger, C. A.: Malignant Melanoma of the External Ear, Ann. Otol. Rhin. & Laryng. **59**:631 (Sept.) 1950.

NOSE

In a well-detailed report Forrest Young [25] divides nasal deformities into three large groups: excesses, deficiencies, and distortions from the normal. The indications for correction are pointed out. One quite rare case of congenital absence of one-half of the nose is presented, with a good final postoperative result.

Webster and Deming [26] have written an excellent general analysis of bifid nose and concomitant deformities, based on 10 cases. This article is too important to be abstracted briefly, and it should be read by every one interested in facial surgery (Figs. 3 and 4).

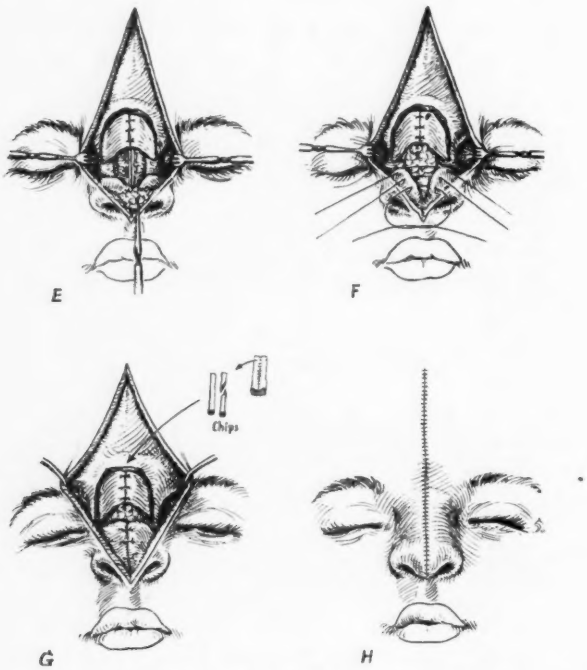

Fig. 4.—*E*, *F*, and *G*, resuturing of the mobilized nasal processes, the bifurcated cartilagenous septum, and the alar cartilages. *H*, closure of skin. (Webster and Deming,[26] pp. 26-27.)

The problems of retarded nasal development are discussed by McLaughlin.[27] He states that the reconstruction in these cases is complex and that the employment of bone alone will not achieve stretching of the inelastic soft tissue. The advice of

25. Young, F.: The Surgical Repair of Nasal Deformities, Plast. & Reconstruct. Surg. **4**:59 (Jan.) 1949.

26. Webster, J. P., and Deming, E. G.: The Surgical Treatment of the Bifid Nose, Plast. & Reconstruct. Surg. **6**:1 (July) 1950.

27. McLaughlin, C. R.: Absence of the Septal Cartilage with Retarded Nasal Development, Brit. J. Plast. Surg. **2**:61 (April) 1949.

Goldman [28] and of Lierle and Huffman [29] is to remove all septal cartilage if it is deformed and to reshape it for insertion as a graft or use preserved septal cartilage.

Turchik [30] lists four annoying postoperative problems encountered in otorhinologic surgery. These are (1) blood fragility, (2) diet problems, (3) allergy, and (4) bruisability.

In an article that is complete and thorough, Sir Harold Gillies [31] emphasizes the importance of good surgery for repair of the columella. This article is mainly concerned with through-and-through losses of this portion of the nose, and it should be read in its entirety (Fig. 5).

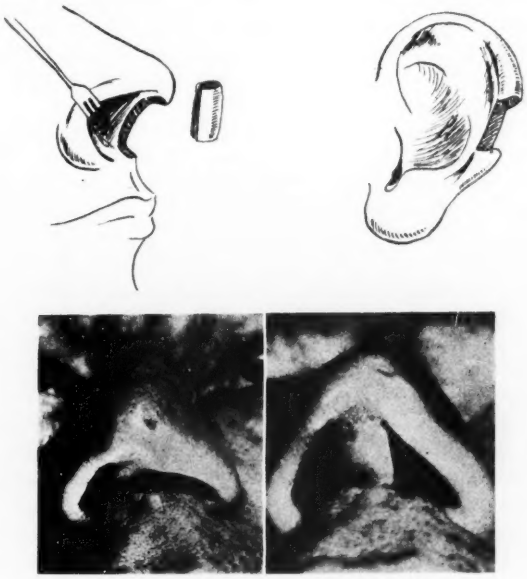

Fig. 5.—Full-thickness lobule graft (Gillies [31]).

Pelliciari [32] urges that a composite graft from the helix or lobule of the ear be used more frequently for correction of partial or total losses about the nasal tip. He makes a special point of advocating its use to correct the short columella which is seen in patients with bilateral cleft lip.

28. Goldman, I. B.: Rhinoplasty: Surgical Complications, J. Internat. Coll. Surgeons **13**:285 (March) 1950.

29. Lierle, D. M., and Huffman, W. C.: Reconstruction of the Nasal Septum, Laryngoscope **59**:858 (Aug.) 1949.

30. Turchik, F.: Annoying Postoperative Problems in Otorhinologic Plastic Surgery, Arch. Otolaryng. **49**:78 (Jan.) 1949.

31. Gillies, H.: The Columella, Brit. J. Plast. Surg. **2**:192 (Oct.) 1949.

32. Pelliciari, D. D.: Columella and Nasal Tip Reconstruction Using Multiple Composite Free Grafts, Plast. & Reconstruct. Surg. **4**:98 (Jan.) 1949.

To define the tip of the nose more definitely while rhinoplasty is being done, Sheehan and Swanker [33] suggest the use of a small rhomboid-shaped piece of cartilage as a graft.

(*Comment.*—Sheehan and Swanker's suggestion to use a small segment of cartilage as a free graft to define the nasal tip more sharply is an excellent one. This procedure is of considerable value in correcting bulbous tips and depressed nasal tips associated with a short columella. We have used the procedure during the past 12 years to sharpen the appearance of the nasal tip in deformed noses associated with severe double harelip deformity, which is always associated with a short columella. We have seen this same procedure used by a number of plastic surgeons, including Kazanjian, Claire Straith, and Clarence Straatsma.

Dr. J. Eastman Sheehan [who died Jan. 8, 1951] was a resourceful surgeon, who did excellent rhinoplasties at a time when plastic surgery was in its infancy. Sheehan was probably the first to transplant one or several "morsels" of alar cartilage to fill slight saddle depressions of the nose.)

Seeley [34] classifies saddle noses into nine different types. He describes a composite bone graft procedure, and, preferring that the graft be taken from the iliac bone, he outlines a method of procurement whereby most of the shaping is done during its removal, so that complex shaping procedures thereafter are not necessary.

(*Comment.*—In our experience bone grafts from the rib or ilium and rib cartilage grafts are required only in extensive saddle depressions of the nose; most saddle noses with a moderate degree of saddle deformity can be satisfactorily repaired by infraction and narrowing of the bony bridge and the utilization of several layers of septal cartilage, with the addition of septal bone when a large graft is required to fill out the saddle depression. Alar cartilage may be used to "cap" the composite graft.

For deep saddle depressions the surgeon must choose between a rib cartilage graft or a bone graft from the rib or from the ilium. It is debatable whether rib bone or iliac bone is the more satisfactory grafting material. We have obtained satisfactory results with both rib and iliac bone, but we prefer to use costal cartilage.)

A report written by Kristensen [35] from the Danish University Hospital concerns largely the correction of saddle nose. The complete procedure of using ox cartilage is given in detail. Stress is laid on the importance of early and correct treatment of fractures of the nose in childhood.

(*Comment.*—Why use ox cartilage in a clinical procedure when the patient's own cartilage or bone is available?)

Seven successful cases in which tantalum was used in rhinoplastic surgery are described by Fox.[36]

(*Comment.*—Why use tantalum? We have removed a considerable number of tantalum implants which had been in place for three or four years before they began to give rise to local irritation.)

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33. Sheehan, J. E., and Swanker, W. A.: A Method for Improvement of the Curved Nasal Tip, Laryngoscope **59**:680 (June) 1949.

34. Seeley, R. C.: Composite Bone Graft in Saddle Nose, Plast. & Reconstruct. Surg. **4**:252 (May) 1949.

35. Kristensen, H. K.: Plastic Surgery in Otology, Ugesk. læger **112**:425, 1950.

36. Fox, S. L.: Tantalum in Rhinoplastic Surgery, Ann. Otol. Rhin. & Laryng. **58**:40 (March) 1949.

In the last two years Farina [37] has written two articles on rhinophyma. The first is a complete study of the different methods of treatment, and in it the author expresses a preference for simple peeling by electrosurgery or a plain knife, leaving a thin layer of dermis on the osteocartilaginous frame. No grafting follows this procedure. In a late 1950 article he presents five cases and concludes that excision with free skin grafting is the method of choice.

An interesting case of elephantiasis nostras nasalis is discussed by Adolph Brown.[38] He used the Byars technique for implantation of radon seeds and then the Safian tip technique for the cosmetic correction of the nasal tip.

Bryant [39] reports on a patient with bilateral dermoid cyst of the nose. Kazanjian [40] concludes that beryllium granuloma of the nose will not subside with conservative treatment and should be widely excised.

A comprehensive, well-illustrated review of bilateral choanal atresia is given by Hanckel.[41] Dolowitz,[42] of Utah University, in describing one case of this condition, points out that he prefers a transpalatine approach in which the soft palate is not separated completely.

(*Comment.*—For bilateral choanal atresia in early infancy we routinely punch openings in the obstructing closure and insert tubes through which the child may breathe. This ability to breathe while taking feedings lessens the danger of an aspiration pneumonia and enhances the infant's likelihood of survival. These small openings have a tendency to close when the tubes are removed, and for this reason we later turn back a palate flap, exposing the area of bony or membranous atresia, the posterior free border of the septum, and the posterior part of the bony palate. Through this exposure it is rather simple to provide adequate choanal openings. None of the openings made in this manner have closed.)

Erich,[43] of the Mayo Clinic, writes on the plastic repair of the nose following the excision of cancer. He reemphasizes the value of the sickle flap.

In two separate papers, Penn [44] points out the importance of the design in using forehead flaps for nasal repairs. He employs a very wide flap utilizing the supraorbital vessels on one side. The profile line and tip are singled out for particular attention. The forehead flap which is brought down is released by means of a V-incision, which reduces the bulk of the nose.

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37. Farina, R.: Rhinophyma: Plastic Correction, Plast. & Reconstruct. Surg. **6**:461 (Dec.) 1950; Rhinophyma: Plain Electrosurgical Peeling, Rev. Hosp. clín. **4**:107 (Jan.) 1949.

38. Brown, A. M.: Elephantiasis Nostras Nasalis: Circumscribed Lymphedema of the Nose. Plast. & Reconstruct. Surg. **6**:467 (Dec.) 1950.

39. Bryant, F. L.: Dermoid Cysts of the Nose, Plast. & Reconstruct. Surg. **5**:180 (Feb.) 1950.

40. Kazanjian, V. H., and Joseph, A. T.: Beryllium Granuloma of the Nose, Plast. & Reconstruct. Surg. **6**:156 (Aug.) 1950.

41. Hanckel, R. W.: Bilateral Choanal Atresia, Ann. Otol. Rhin. & Laryng. **58**:852 (Sept.) 1949.

42. Dolowitz, D. A., and Holley, E. B.: Congenital Choanal Atresia: A New Transpalatine Technic, Arch. Otolaryng. **49**:587 (June) 1949.

43. Erich, J. B.: Cancer of the Nose: Plastic Repair, Laryngoscope **59**:839 (Aug.) 1949.

44. Penn, J.: Rhinoplastic Flap Design in the Narrow Forehead, Brit. J. Plast. Surg. **2**:132 (July) 1949; The Pattern of the Forehead Flap in Rhinoplasty, South African M. J. **24**:937 (Nov.) 1950.

Seltzer [45] has devised an electrically driven saw for rhinoplastic work. This saw is circular, shaped like a pistol, and the author states that it does not injure the tissues.

CLEFT PALATE AND CLEFT LIP

In a most interesting article Slaughter and Brodie [46] present their concept of the management of cleft lip and palate which has been formed after handling 1,349 cases. On the basis of their research findings they conclude that there must be no unwarranted trauma to soft tissues and no interference with blood supply. Any fracturing of bone or stripping of periosteum in an effort to close the lip or palate is to be avoided if there is to be no permanent damage to growth centers. Other evidence is available to show that congenitally deformed parts, unless permanently damaged, grow at a normal rate (Fig. 6).

Fig. 6.—Sites of growth of the face (frontomaxillary, zygomatic-maxillary, pterygomaxillary, posterior surface, and condyle of mandible) (Slaughter and Brodie,[46] p. 313).

Graber,[47] of the Department of Orthodontics, Northwestern University, Chicago, counsels against surgical repair of the cleft palate until the patient is 4 years of age, when five-sixths of the maxillary growth is present. Orthodontic treatment, while improving the tooth relationship in many patients, does not necessarily stimulate development of the basal bone. Surgical intervention for the repair of the cleft palate when the child is 4 to 6 years of age is advised by Coursin.[48]

45. Seltzer, A. P.: The Seltzer Circular Rhinoplastic Saw, Plast. & Reconstruct. Surg. **5**:261 (March) 1950.

46. Slaughter, W. B., and Brodie, A. G.: Facial Clefts and Their Surgical Management in View of Recent Research, Plast. & Reconstruct. Surg. **4**:311 (July) 1949.

47. Graber, T. M.: Changing Philosophies in Cleft Palate Management, J. Pediat. **37**:400 (Sept.) 1950; Craniofacial Morphology in Cleft Palate and Cleft Lip, Surg., Gynec. & Obst. **88**:359 (March) 1949.

48. Coursin, D. B.: Treatment of the Patient with Cleft Palate, Am. J. Dis. Child. **80**:442 (Sept.) 1950.

Eighty-four human embryos and fetuses were studied by Woo [49] to determine the method of ossification and growth of the human premaxilla, maxilla, and palate bone. He states that the maxilla proper is developed from one ossification center, beginning at the end of the first week.

Waldron [50] recommends a method for repairing the unilateral cleft of the hard palate by means of a mucoperiosteal hinged flap from the vomer as a means of interfering to the least possible degree with subsequent growth. The cleft in the palate is repaired before the lip is repaired, and correction of the soft palate is done after a period of two years or later.

(*Comment.*—The best age at which to operate on cleft palate deformities is quite debatable at this time. Authorities can be quoted for early operation on the basis that the children will learn to speak better, and other authorities [cited in this review] believe that operations on the hard palate should be postponed until the child is 4 years of age or older.

The best position in this controversy at the present time appears to be in the middle of the road between the two extreme viewpoints. We close the complete palatal clefts by the bone flap method of the late Warren B. Davis when the child is 18 to 20 months of age. This permits the child to have a normally functioning palate as he begins to learn to speak. We feel that poor speech is a much greater handicap for the child than faulty development of the superior maxilla.)

An editorial [51] appearing in *Plastic and Reconstructive Surgery* makes one aware of the controversial nature of the management of cleft palate. In this, there is a plea for all specialists to cooperate and for investigators to be honest in analyzing their results.

One of the most important contributions to plastic surgery in the last two years was made by LeMesurier,[52] of Toronto, Canada. The author reintroduces a method of harelip repair that had apparently become lost to the American literature for several decades. The original procedure was described by Hagedorn in 1892. The type of flap discussed in LeMesurier's article is quadrilateral and the many advantages of this shape become obvious. The illustrations and the explanatory texts are very clear, and the principle can be applied to both the complete and the incomplete clefts. The necessary modifications for each type are well presented.

Steffensen [53] introduces a modification of the method of hairlip repair reported by LeMesurier, in which the latter modified the Hagedorn procedure (Fig. 7). In addition, he gives a method of repairing the nostril which involves division of both the alar and the upper lateral cartilages and an incision which almost encircles the nostril just inside the rim.

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49. Woo, J. K.: Ossification and Growth of the Human Maxilla, Premaxilla and Palate Bone, Anat. Rec. **105**:737 (Dec.) 1949.

50. Waldron, C. W.: Management of Unilateral Clefts of the Palate, Plast. & Reconstruct. Surg. **5**:322 (April) 1950.

51. Recent Trends in Cleft Palate Treatment, editorial, Plast. & Reconstruct. Surg. **5**:537 (June) 1950.

52. LeMesurier, A. B.: A Method of Cutting and Suturing the Lip in the Treatment of Complete Unilateral Clefts, Plast. & Reconstruct. Surg. **4**:1 (Jan.) 1949.

53. Steffensen, W. H.: A Method for Repair of the Unilateral Cleft Lip, Plast. & Reconstruct. Surg. **4**:144 (March) 1949.

(*Comment.*—LeMesurier's revival of the old Hagedorn procedure for unilateral harelip repair received little attention in the United States until Steffensen wrote

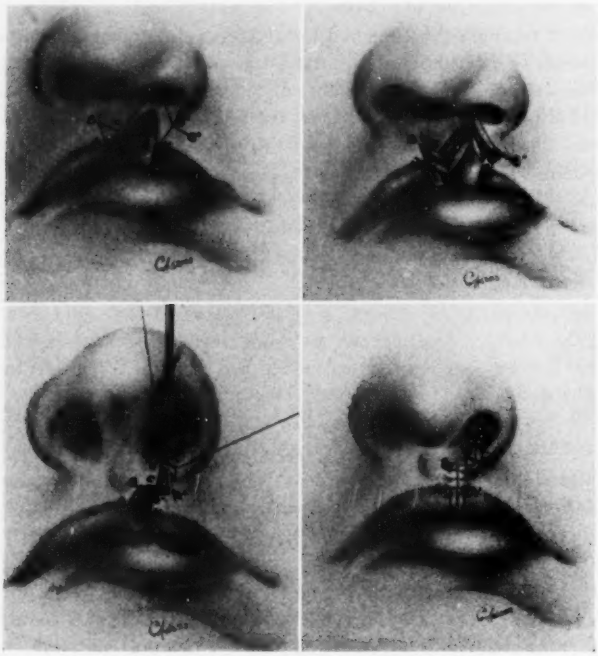

Fig. 7.—Steffensen's modification of the Hagedorn-LeMesurier procedure (Steffensen,[58] p. 146).

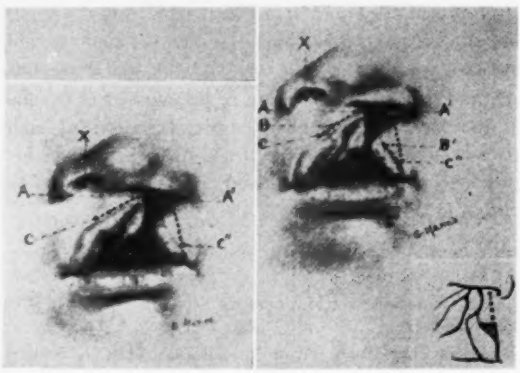

Fig. 8.—Barrett Brown's method of measurements for the triangular flap method for repairing cleft lip (Brown and McDowell,[55] p. 397).

an article about his favorable results from use of this method, which was published in *Plastic and Reconstructive Surgery.*

We have routinely used the Hagedorn-LeMesurier technique for repair of unilateral harelip during the past two years, and we believe that it has numerous advantageous features.)

Straith, Pilling, and Lewis [54] also write on the Hagedorn cleft lip technique as described by LeMesurier. It is used almost exclusively now at the Straith Clinic in Detroit.

In a clearly presented article, Brown and McDowell [55] defend the use of the small triangular flap operation for the primary repair of single cleft lip. They express preference for the use of this type of flap, in which no skin is discarded, rather than square flaps (Fig. 8).

(*Comment.*—The old Mirault-Blair procedure utilizing a triangular flap is an excellent technique, which has stood the test of time. We used it for a great many years and still occasionally use it for single harelip.

It would be interesting if Barrett Brown could be induced to use his fine surgical abilities to perform the LeMesurier-Hagedorn technique and compare the results in such cases with those in similar cases in which the Mirault-Blair technique was used.)

A detailed study of the typical nasal deformities associated with the unilateral harelip was prepared by Huffman and Lierle.[56] These men follow the theory that most of the nasal deformities present in association with unilateral harelip are due to a rotation of one or both lower lateral alar cartilages, rather than to any inherent abnormality in their size and shape, and have attempted to devise a basic procedure aimed at placing them in their proper positions.

These two workers have also presented a procedure for handling of the complicated bilateral harelip. They begin the operation by removing a portion of the nasal septum. At the time this is done, the hard palate is closed by the use of septal flaps, as advocated by Dorrance. In two to eight weeks one side of the lip is repaired according to Brown's method. Four to eight weeks later the remaining side is closed.[57]

Farina [58] believes the separate closure of each side of a bilateral harelip, as advocated by Veau, is not ideal. He prefers the technique proposed by Thiersch, i. e., reduction of the premaxilla by elastic pressure 20 to 30 days before surgical intervention.

A report of three cases of unusual cleft lip is made by Braithwaite, and Watson.[59] It should be read for the teratological interest, because the multiple features present in each case make abstracting difficult.

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54. Straith, C. L.; Pilling, M. A., and Lewis, J. R.: Repair of Single Cleft Lip by the Hagedorn-LeMesurier Technic, J. Internat. Coll. Surgeons **13**:394 (April) 1950.

55. Brown, J. B., and McDowell, F.: Small Triangular Flap Operation for the Primary Repair of Single Cleft Lips, Plast. & Reconstruct. Surg. **5**:392 (May) 1950.

56. Huffman, W. C., and Lierle, D. M.: Studies on the Pathologic Anatomy of the Unilateral Harelip Nose, Plast. & Reconstruct. Surg. **4**:225 (May) 1949.

57. Huffman, W. C., and Lierle, D. M.: The Repair of the Bilateral Cleft Lip, Plast. & Reconstruct. Surg. **4**:489 (Nov.) 1949.

58. Farina, R.: Total Bilateral Harelip: Bilateral Cheiloplasty with Previous Mirault-Blair's Technic and Slow Non-Operative Reduction of the Premaxilla with a Rubber Band (Thiersch's Procedure), Rev. Hosp. clín. **3**:19 (Jan.) 1948.

59. Braithwaite, F., and Watson, J.: A Report on Three Unusual Cleft Lips, Brit. J. Plast. Surg. **2**:38 (April) 1949.

Albert Davis [60] presents the record of an interesting case of medial cleft of the lower lip and mandible. Reports of only six cases of this condition had appeared previously.

Dingman and his co-workers [61] have devised a method of measurement for evaluation of blood loss in cleft lip and palate surgery, based on the conversion of hemoglobin to oxyhemoglobin. Epinephrine, even in low concentration, is shown to be of great benefit in preventing blood loss. A table is presented to show the relationship of blood loss to total blood volume.

To improve speech in patients with cleft palate, Baxter and his colleagues [62] advise the push-back operation, as described by Dorrance. They use a split graft of skin to cover the raw surfaces, as they feel that this causes less contracture and scarring.

Marino and Segre [63] give a combined procedure in which the last stage of a push-back operation is done according to the Dorrance technique. A thick pharyngeal flap with an inferior pedicle is then dissected and sutured to the velum. They state that improvement in speech is noted following this operation.

Four cases of extensive palatal losses repaired with skin tubes are reported by Kostrubala.[64] He prefers to introduce the tube into the oral cavity rather than through the normal mouth opening.

In an interesting article containing excellent drawings, Grundt [65] stresses the importance of collaboration between the plastic surgeon and the orthodontist.

The method of speech rehabilitation used at the speech clinic of the Manhattan Ear, Nose and Throat Hospital is described by Freud.[66] According to Blocker and Blocker,[67] there are 1,200 speech teachers in this country and the need is for 20,000. They present the plan in use at the University of Texas, where parents are taught a method for home training of their own children.

In separate articles, Houghton [68] and Street [69] discuss the problem of rehabilitation of the patient with a cleft palate. Each describes an appliance to simulate the velum of the palate.

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60. Davis, A. D.: Medial Cleft of the Lower Lip and Mandible, Plast. & Reconstruct. Surg. **6**:62 (July) 1950.

61. Dingman, R. O.; Ricker, O. L., and Iob, V.: Blood Loss in Infant Cleft Lip and Cleft Palate Surgery, Plast. & Reconstruct. Surg. **4**:333 (July) 1949.

62. Baxter, H.; Drummond, J., and Entin, M.: Use of Skin Grafts in Repair of Cleft Palate to Improve Speech, Arch. Surg. **59**:804 (Oct.) 1949.

63. Marino, H., and Segre, R.: Cleft Palate: Pharyngo-Staphyline Fixation as a Complement to a Pushback Operation, Brit. J. Plast. Surg. **3**:222 (Oct.) 1950.

64. Kostrubala, J. G.: Repair of Extensive Palatal Defects with Skin Tubes, Plast. & Reconstruct. Surg. **5**:512 (June) 1950.

65. Grundt, B.: A Plea for the Cooperation of the Plastic Surgeon and the Orthodontist in the Treatment of Cleft Lip and Palate, Brit. J. Plast. Surg. **3**:176 (Oct.) 1950.

66. Freud, E. D.: Speech Rehabilitation of Patients with Cleft Palate, Arch. Otolaryng. **51**:685 (May) 1950.

67. Blocker, T. G., Jr., and Blocker, V.: A Speech Training Program for Cleft Palate Children, Postgrad. Med. **7**:439 (June) 1950.

68. Houghton, W. G.: Rehabilitation of the Cleft Palate Patient, Am. J. Orthoped. Surg. **36**:348 (May) 1950.

69. Street, R. F.: Congenital Cleft Palate Appliance, J. California Dent. A. **26**:58 (April) 1950.

MOUTH AND TONGUE

With the aid of many photographs, Blair and Letterman [70] show the value of the switched lower lip flap in restorations of the upper lip. They advise taking the flap from the center of the lower lip.

For denture retention in the long-edentulous mouth in which the alveolar processes have been completely absorbed, Mayer and Swanker [71] use a buccal inlay skin graft.

Conley [72] reports a case of partial excision of the tongue for epithelioma in which, all the dorsal surface having been denuded, the area was affected by leucoplakia. A split graft was applied and was held in place with a metal covering anchored to the mandible.

To repair a partial traumatic amputation of the tongue (the anterior third) Ulloa [73] used a mucous-muscular flap of the same tongue (Fig. 9).

In an interesting article, Peacher [74] discusses the value of neurosurgery, surgery, plastic surgery, and speech therapy in treating patients with speech disorders in

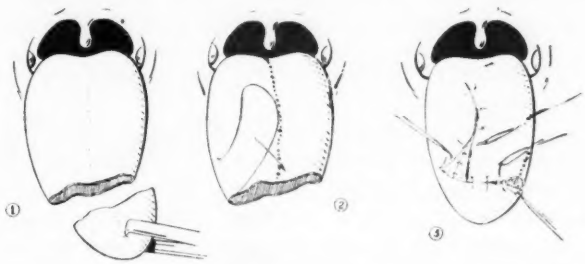

Fig. 9.—Ulloa's method of utilizing a flap for the repair of a partially amputated tongue (Ulloa,[73] p. 187).

World War II. He concludes that the prognosis in all cases of lingual involvement, structural and/or neurological, was good except in severe bilateral hypoglossal paralysis and extensive loss of the tongue.

According to Hiebert and Brooks,[75] the prognosis in fibroma of the palate is good if the neoplasm has been adequately removed. They describe two cases of bilateral symmetrical fibromas.

70.. Blair, V. P., and Letterman, G. S.: The Role of the Switched Lower Lip Flap in Upper Lip Restorations, Plast. & Reconstruct. Surg. **5**:1 (Jan.) 1950.

71. Mayer, D. M., and Swanker, A.: Buccal Inlay Skin Grafts for Denture Retention, Plast. & Reconstruct. Surg. **6**:479 (Dec.) 1950.

72. Conley, J. J.: A Technique of Skin Grafting to the Tongue and Case Report, Plast. & Reconstruct. Surg. **5**:450 (May) 1950.

73. Ulloa, M. G.: Repair of a Partial Traumatic Amputation of the Tongue, Plast. & Reconstruct. Surg. **5**:186 (Feb.) 1950.

74. Peacher, W. G.: Speech Disorders in World War II, Plast. & Reconstruct. Surg. **5**:123 (Feb.) 1950.

75. Hiebert, A. E., and Brooks, H. W.: Fibroma of the Palate, Plast. & Reconstruct. Surg. **5**:532 (June) 1950.

PHARYNX, LARYNX, AND ESOPHAGUS

In describing a case of total pharyngoneoplasty, Farina [76] stresses the importance of the principle of nonsuperposition of the suture layers to insure a successful operation. He also finds that salivation and growth of hair in the interior of the pharynx no longer offer any serious obstacle to such repairs. In pharyngoplasty, Hynes [77] raises a mucomuscular flap on each lateral wall, consisting of the salpingopharyngeus muscle and its overlying mucosa. These flaps are transplanted upward and inward until they lie in a transverse mucosal defect created across the posterior wall of the nasopharynx. A prominent ridge is formed above the level of Passavant's cushion.

Vaughan [78] supplements the observations on nasopharyngeal stenosis made by him in 1946. He reviews the three cases previously reported and adds a fourth case, in which flaps have been used rather than simple dilatation, as had been used in his previous cases. Again, the need for dilatation following operation, regardless of the type of operative procedure employed, is stressed.

In a case reported by McLaughlin and Ireland,[79] atresia of the nasopharynx followed indeterminate ulcerative pharyngitis. To correct this, they used a free skin graft held in place by an ingenious rigid appliance consisting of a silver tube fastened to the teeth. Robertson [80] also used a split graft to cover the defect in a patient with cicatricial stenosis of the hypopharynx. The entire stenosed area was removed through an external approach.

Three cases in which rather extensive malignant tumors of the larynx were removed by hemilaryngectomy are reported by Figi.[81] The operation was followed by immediate skin grafting for repair. The graft was sutured around a sponge-rubber stint, which was removed 10 days later. When skin grafting was done immediately after removal of the carcinoma, cicatricial stenosis was obviated. In two cases in which most of one ala of the thyroid cartilage had been removed there was no tendency for the laryngeal wall to collapse.

A complete article regarding the factors responsible for laryngeal obstruction in infants is presented by Holinger and Johnston.[82] They divide the discussion into anatomic and pathologic etiological factors. Congenital lesions include congenital cysts and webs, congenital laryngeal stridor, and paralysis. Acquired lesions are laryngotracheobronchitis, acute epiglottitis, catheterization edema, benign and malignant neoplasms, and foreign bodies.

76. Farina, R.: Total Pharyngoneoplasty, Plast. & Reconstruct. Surg. **6**:58 (July) 1950.

77. Hynes, W.: Pharyngoplasty by Muscle Transplantation, Brit. J. Plast. Surg. **3**:128 (July) 1950.

78. Vaughan, H. S.: Nasopharyngeal Stenosis: Correction by Transposed Flaps, Plast. & Reconstruct. Surg. **4**:522 (Nov.) 1949.

79. McLaughlin, C. R., and Ireland, V. E.: Nasopharyngeal Atresia, Plast. & Reconstruct. Surg. **6**:301 (Oct.) 1950.

80. Robertson, R. E.: Cicatricial Stenosis of the Hypopharynx Treated with a Skin Graft, Arch. Otolaryng. **50**:457 (Oct.) 1949.

81. Figi, F. A.: Removal of Carcinoma of the Larynx with Immediate Skin Graft, Ann. Otol. Rhin. & Laryng. **59**:474 (June) 1950.

82. Holinger, P. H., and Johnston, K. C.: Factors Responsible for Laryngeal Obstruction in Infants, J. A. M. A. **143**:1229 (Aug. 5) 1950.

The repair of a damaged esophagus by suture in the posterior mediastinum by a thoracic surgeon is the method of choice according to Mortimer Shaw.[83] If this is not feasible, then a Yudin jejunal loop should be employed. When neither of these repairs can be carried out, the plastic surgeon must be called in to do a skin tube reconstruction.

Cutaneous antethoracic esophagoplasties are discussed by Darrel T. Shaw.[84] Good illustrations of two patients are included. Shaw's results are apparently better than those usually seen. A concise outline of the surgical management of the reconstruction of the esophagus is given by Ragnel.[85] He covers the esophageal skin tube with an acromiopectoral and thoracoabdominal tube pedicle. This, he feels, increases security.

Lewis [86] describes a one-stage reconstruction of the cervical esophagus, with good diagrams, and points out that this procedure should be done even in the face of a possible uncured malignant growth.

A twofold burying of the skin for correcting stenosis following esophagoplasties was employed by Lázár.[87] His method is a simple type for this common complication and one that can be done in one operation.

FACE AND NECK

Neal Owens [88] corrects his previous observations on the correction of facial paralysis on the basis of later experience with the use of the masseter muscle. He now believes that direct masseter muscle transplants to the paralyzed side of the mouth provide better function than fascial strips attaching the mouth to the masseter muscle.

In the treatment of seventh nerve paralysis, Grundt [89] uses a portion of the palmaris longus tendon with the paratendon and a flap of the temporalis muscle detached from the coronoid process. This tendon is then inserted and sutured to the orbicularis muscle. It moves freely because it does not attach itself to the surrounding tissue. For treatment of facial paralysis Aschan [90] carries out a modified Gillies procedure, utilizing temporal muscle and fascia lata. He reports on 30 cases and states that his best results are obtained on patients between 20 and 40 years of age.

In reporting on the use of tantalum in the correction of facial palsy, J. Eastman Sheehan [91] states that he uses braided double wire. He feels that tantalum gauze to

83. Shaw, M. H.: Reconstruction of the Esophagus, Brit. J. Plast. Surg. **3**:96 (July) 1950.

84. Shaw, D. T.: Cutaneous Antethoracic Esophagoplasty, Plast. & Reconstruct. Surg. **5**:289 (April) 1950.

85. Ragnel, S.: Reconstruction of the Esophagus, Acta. chir. scandinav. **98**:368, 1949.

86. Lewis, J. R.: One Stage Reconstruction of the Cervical Esophagus, Plast. & Reconstruct. Surg. **5**:296 (April) 1950.

87. Lázár, D.: A New Method for Correction of Stenosis Following Esophagoplasty, Plast. & Reconstruct. Surg. **6**:403 (Nov.) 1950.

88. Owens, N.: Preliminary Report on the Development of Neuro-Muscular Junctions in Cases of Facial Paralysis Followed by Masseter Muscle Transplantations, Plast. & Reconstruct. Surg. **6**:345 (Nov.) 1950.

89. Grundt, B.: Surgical Treatment of Seventh Nerve Paralysis, Brit. J. Plast. Surg. **3**:50 (April) 1950.

90. Aschan, P. E.: Plastic Surgical Treatment of Facial Paralysis, Tr. North S. A., June. 1949.

91. Sheehan, J. E.: Progress in Correction of Facial Palsy with Tantalum Wire and Mesh, Surgery **27**:122 (Jan.) 1950.

reenforce the loop at its affixation to the lip prevents the tendency of the wire to cut through the muscle bundle.

Epiphora is frequently the worst of disabilities associated with facial paralysis. McLaughlin [92] describes a method of supporting the cheek with fascia, restoring the tension and position of the lid, enlarging the punctum and canaliculus, and, if necessary, reducing the caruncle.

Putney,[93] of the Jefferson Medical College, states that the intratemporal repair of the facial nerve is preferable to other types of repair for facial nerve paralysis.

For spastic facial palsy, Marino and Alurralde [94] feel that the most accurate and the more selective method of approach is by peripheral neurotomy of the terminal branches going to the contractile muscles responsible for the symptoms. Advantages of this procedure are (1) that a face lift incision is made, (2) intraglandular investigation is eliminated, and (3) selection of the territory to be paralyzed is easy.

Three cases in which fat grafts were employed to restore normal contour to the face are presented by Stevenson.[95] He feels that one should put in approximately 50% more fat than appears desirable to allow for estimated shrinkage.

Rubin [96] concludes that polyethylene shavings are the most resilient and nonreactive substitute which can be offered for soft tissue defects in facial reconstruction. He apparently considers the polyethylene superior to fat or dermis.

(*Comment.*—The best covering for exposed surface losses is autogenous skin or mucous membrane, and the best type of buried graft to restore deep losses, is an autogenous graft which is identical with or approximates the tissue which has been lost. Thus, a bone graft is best to replace lost bone; a cartilage graft, lost cartilage, and fat or dermal grafts, large fatty loss. Fat and dermal grafts must be used as a substitute for a muscle loss, since free muscle grafts are rapidly replaced by fibrous tissue.

Polyethylene shavings may be inert at the time of burial, but this does not necessarily mean that they will remain inert for 20 years or more. The recognized authorities of 30 years ago stated that paraffin was inert in human tissues.)

The use of dermal grafts for correction of facial defects is carefully analyzed by Schuessler and Steffanoff.[97] They feel that the dermal graft is superior to cartilage because the former is soft and pliable, the graft is easier to obtain, and the supply is abundant. These authors believe that dermis is superior to free fat because of the great absorption of the fat grafts.

Kazanjian [98] has written an article on the use of skin flaps in facial deformities that is too important to be reviewed briefly. It should be read in its entirety.

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92. McLaughlin, C. R.: Epiphora in Facial Paralysis, Brit. J. Plast. Surg. **3**:87 (July) 1950.

93. Putney, F. J.: The Intratemporal Repair of Facial Paralysis, Ann. Otol. Rhin. & Laryng. **58**:1109 (Dec.) 1949.

94. Marino, H., and Alurralde, A.: Spastic Facial Palsy—Peripheral Selective Neurotomy, Brit. J. Plast. Surg. **3**:56 (April) 1950.

95. Stevenson, T. W.: Fat Grafts to the Face, Plast. & Reconstruct. Surg. **4**:458 (Sept.) 1949.

96. Rubin, L. R.: Fat Substitutes in Cheek Deformities, Plast. & Reconstruct. Surg. **4**:269 (May) 1949.

97. Schuessler, W. W., and Steffanoff, D. N.: Dermal Grafts for Correction of Facial Defects, Plast. & Reconstruct. Surg. **4**:341 (July) 1949.

98. Kazanjian, V. H.: The Use of Skin Flaps in the Repair of Facial Deformities, Plast. & Reconstruct. Surg. **5**:337 (April) 1950.

For the reconstruction of facial defects, Steiss [99] holds that the use of the tubed pedicle is usually reserved for those patients lacking sufficient adjacent material for

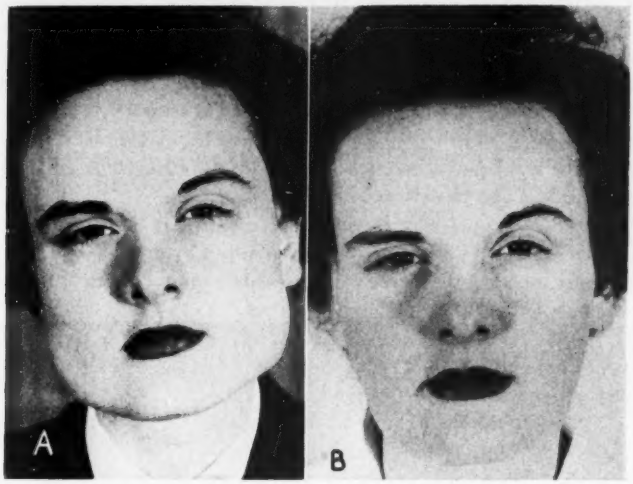

Fig. 10.—*A*, Adam's patient with muscles of face relaxed, showing wide protrusion of the angles of the jaws and the square facial contour. *B*, no apparent disproportion of the face when patient clenches the teeth (Adams [105]).

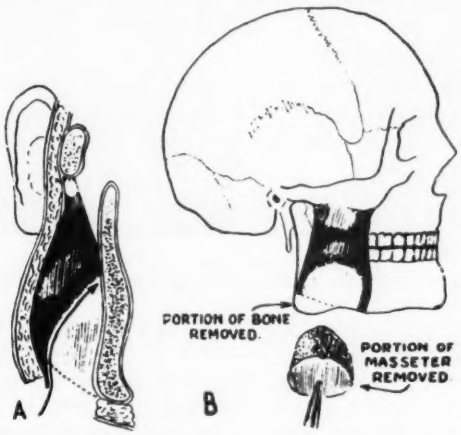

Fig. 11.—*A*, front view showing portion of masseter muscle removed. *B*, side view showing amount of muscle removed (Adams [105]).

repair by other means. The neck pedicle is the one he prefers to use if this is feasible. Erich [100] has written on traumatic defects of the nose and cheeks.

99. Steiss, C. G.: Utilization of the Tube Pedicle in the Reconstruction of Facial Defects, Plast. & Reconstruct. Surg. **4**:545 (Nov.) 1949.

100. Erich, J. B.: Traumatic Defects of the Nose and Cheeks, Surg. Clin. North America **29**:1009 (Aug.) 1949.

Good sketches illustrate the type of incisions that Mayer and Swanker [101] use for a rhytidoplasty and eyelidplasty One advantage of using this kind of incision is that the front hairline does not have to be shaved preoperatively. Sheehan and Swanker [102] advise shaving for obliteration of scarring. This, he states, is contraindicated in case of keloids. For these lesions he prefers irradiation prior to removal.

An interesting case of removal of tattoos by excision, sandpapering, and shaving with a razor blade, with good results, is reported by Weaver.[103]

A step-by-step reconstruction of the chin, lower lip, symphysis of the mandible, and most of the lower jaw is described by Grocott,[104] of England. He used an acromiopectoral pedicle and cancellous bone chips.

William Adams [105] presents an interesting case report on bilateral hypertrophy of the masseter muscle. Correction was accomplished by excision of a segment from the lower inner aspect of the masseter muscles and removal of the protruding angles of the mandible (Figs. 10 and 11).

Until further evidence is offered, Sutton [106] believes that a defect of the germ plasm is the best explanation of hemihypertrophy of the face. He presents one interesting case in which the condition began at the age of 6 months. The report on this case brings the total in the literature to about 30 cases.

Bilateral cleft of the face as in a case reported by Potter [107] shows the effect of nonunion between the central and lateral parts of the face to a much greater degree than bilateral harelip. Potter completed the surgery on this patient in five stages. Blackfield and Wilde [108] attempted to find an explanation for lateral facial clefts but were unsuccessful. It is unlikely that any one explanation will account for the origin.

Straith and Lewis [109] reviewed the literature on the subject of the Treacher Collins syndrome and found four cases reported in England and none in America. Five cases are described, and the embryological and etiological factors are discussed briefly. The syndrome consists of congenital symmetrical notching of the outer third of each lower eyelid with deficient malar bone. In the original cases reported by Collins,

101. Mayer, D. M., and Swanker, W. A.: Rhytidoplasty, Plast. & Reconstruct. Surg. **6**:255 (Oct.) 1950.

102. Sheehan, J. E., and Swanker, W. A.: Obliteration of Scars by Shaving, Plast. & Reconstruct. Surg. **6**:153 (Aug.) 1950.

103. Weaver, D. F.: Multiple Needle Tattoos of the Face, Plast. & Reconstruct. Surg. **4**:473 (Sept.) 1949.

104. Grocott, J.: Discussion of Some Problems of a Case of Chin Reconstruction, Brit. J. Plast. Surg. **3**:82 (July) 1950.

105. Adams, W. M.: Bilateral Hypertrophy of the Masseter Muscle: An Operation for Correction (Case Report), Brit. J. Plast. Surg. **2**:78 (July) 1949.

106. Sutton, L. E.: Hemihypertrophy of the Face, Plast. & Reconstruct. Surg. **4**:276 (May) 1949.

107. Potter, J.: A Case of Bilateral Cleft of the Face, Brit. J. Plast. Surg. **3**:209 (Oct.) 1950.

108. Blackfield, H. M., and Wilde, N. J.: Lateral Facial Clefts, Plast. & Reconstruct. Surg. **6**:68 (July) 1950.

109. Straith, C. L., and Lewis, J. R.: Associated Congenital Defects of the Ears, Eyelids and Malar Bones (Treacher Collins Syndrome), Plast. & Reconstruct. Surg. **4**:204 (March) 1949.

there were no associated deformities of the ears, but in the cases reported later and in the five cases reported in this study all the patients had bilateral deformities with and without deafness (Fig. 12).

Several more features are added to the Treacher Collins syndrome by O'Connor and Conway.[110] They use the term "dysostosis mandibulo-facialis."

In a French publication, Koechlin [111] gives a good review of the literature and the embryological development of inclusion cysts of the lower lip. The defect is hereditary and infrequent. The treatment of choice is a V-incision.

Freidberg [112] discusses rehabilitation surgery in gunshot wounds of the neck. He urges that better tracheotomies be performed.

Correia and Vellutini [113] describe different methods for retracting scars of the neck. The illustrations in the article show that the authors have an understanding of the problems involved in such scars.

Fig. 12.—Deep depression below and lateral to each eye, ears deformed, chin receding, palpebral fissures oblique (Straith and Lewis,[109] p. 208).

To prevent facial distortion in wryneck, Brown, McDowell, and Fryer [114] remove the fibrosed sternomastoid muscle. The loss of the muscle has not produced other

110. O'Connor, G. B., and Conway, M. E.: Treacher Collins Syndrome (Dysostosis Mandibulo-Facialis), Plast. & Reconstruct. Surg. **5**:419 (May) 1950.

111. Koechlin, H.: Congenital Fistulae of the Lower Lip, Transmitted Through Four Generations, Praxis **40**:918 (Oct.) 1950.

112. Freidberg, S. A.: Rehabilitation Surgery in Gunshot Wounds of the Neck, Ann. Otol. Rhin. & Laryng. **58**:926 (Sept.) 1949.

113. Correia, P., and Vellutini, D. F.: Surgical Treatment of Retracting Scars of the Neck, Rev. Hosp. clín. **4**:25 (Jan.) 1949.

114. Brown, J. B., and McDowell, F.: Wry-Neck Facial Distortion Prevented by Resection of Fibrosed Sternomastoid Muscle in Infancy and Childhood, Ann. Surg. **131**:721 (May) 1950. Brown, J. B.; McDowell, F., and Fryer, M. P.: Facial Distortion in Wry-Neck Prevented by Early Resection of the Fibrosed Sternomastoid Muscle, Plast. & Reconstruct. Surg. **5**:301 (April) 1950.

deformities or too noticeable irregularity in the contour of the neck. They perform the operation in the first 10 months of life after a trial with stretching.

FACIAL BONES

McKensie [115] divides fractures of the facial bones into four groups: (1) fractures of the nasal bones, (2) fractures of the malar bone and superior maxilla, (3) fractures of the mandible, and (4) fractures of all facial bones. This article is limited to injuries of the nose and the malar-zygomatic arch. The author summarizes: "Recent injuries should be treated as soon as practicable; old fractures should be treated as soon as the patient becomes aware of the injury." Moore and Ward [116] make a plea for early recognition of fractures of the facial bones and advocate refracture and reduction of malunited fractures rather than substitution treatment.

A jackscrew type of splint of stainless steel was found to be satisfactory by Anthony and Fisher [117] in the management of healed depressed fractures of the orbital floor and the inferior rim. This splint was inserted into the maxillary sinus.

Despite the many various and complex methods of maintaining immobilization of jaw fractures, Brown, McDowell, and Fryer [118] consider that interdental wiring is still the method of choice, if it is feasible. They further state that when for any reason interdental wiring is not sufficient the fractured mandible can be immobilized by a Kirschner wire driven across the fracture site.

Stuart Gordon [119] points out that after five days the ends of a fractured malar bone become rounded, causing a recurrence of the deformity. He elevates the bones by the method described by Gillies, Kilner, and Stone. He then runs a long bayonet needle beneath the periosteum to hold the fragments in position.

Open reduction of a fractured mandible is usually a simple matter in the opinion of Kleitsch and Smith.[120] They describe a difficult case in which they used modified Sherman bone plates successfully. Kleitsch [121] also describes the value of antrotomy for fracture of the malar bone. A screw is put in the malar bone, which is attached to a skull cap. Two old fractures of the malar bone with permanent occlusion are discussed by Fitte and Mejia.[122] Fixation of the coronoid process makes surgical section of the temporal tendon, or even resection of the epiphysis, imperative. In this procedure, the authors prefer the external approach.

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115. McKensie, W. R.: Fractures of the Facial Bones, Arch. Otolaryng. **52**:257 (Aug.) 1950.

116. Moore, F. T., and Ward, T. G.: Complications and Sequelae of Untreated Fractures of the Facial Bones, Brit. J. Plast. Surg. **1**:257 (Jan.) 1949.

117. Anthony, D. H., and Fisher, D. F.: Splint (Stainless Steel) Orbital Floor or Rim Fracture Jackscrew, Tr. Am. Acad. Ophth. & Otol. March-April, 1950, p. 379.

118. Brown, J. B.; Fryer, N. P., and McDowell, F.: Internal Wire-Pin Immobilization of Jaw Fractures, Plast. & Reconstruct. Surg. **4**:30 (Jan.) 1949.

119. Gordon, S. D.: Fractures of the Malar: A Method for Maintaining Position in Cases in Which Reduction Is Delayed, Brit. J. Plast. Surg. **2**:134 (July) 1949.

120. Kleitsch, W. P., and Smith, M. R.: The Open Reduction of Fractured Mandibles, Plast. & Reconstruct. Surg. **6**:312 (Oct.) 1950.

121. Kleitsch, W. P.: Antrotomy for Fracture of the Malar Bone, Plast. and Reconstruct. Surg. **5**:176 (Feb.) 1950.

122. Fitte, M. J., and Mejia, A. R.: Malar Fracture: Permanent Occlusion of the Mouth, Prensa méd. argent. **37**:1009, 1950.

Cardwell [123] reports a large number of cases of fracture of the zygoma which were repaired by several different methods, including the Gillies temporal approach, the Caldwell-Luc procedure, and the intranasal route. He offers as the instrument of choice for the latter method the male urethral sound. The author stresses early correction of these deformities and states that by the use of the intranasal method a difficult and complex type of procedure can be avoided. In Graham's opinion [124] also, it is essential that treatment of injuries of the maxilla and zygoma be early. He considers the Gillies method the best procedure.

A new operation for luxation in the temporomandibular joint is introduced by Boman.[125] This is based on the principle of restricting the forward movement of the condyle by reducing the function of the forward drawing muscle, the external pterygoid.

Two cases of congenital arteriovenous fistulas in the mandible were recognized by Clay and Blalock.[126] No reports of previous cases were found in the literature. Deep pressure on the common carotid artery may obliterate the thrill. Operative treatment consists of temporary ligation of the common carotid artery.

Ivy [127] reports a case of benign hyperplasia of the mandibular condyle presenting "cross-bite" occlusion of the teeth and marked enlargement on roentgenographic examination. He states that most authors agree that the treatment indicated is resection of the enlarged condyle. He prefers exposure by the Risdon incision and uses a Gigli saw to divide the neck of the mandible. The mass is then removed intact.

Gordon and MacRae [128] speculate on the cause of monocular blindness following reduction of a malar fracture by the temporal approach. They suggest that intraneural hemorrhage occurred, probably in or near the intracanalicular portion of the nerve, and the resultant swelling shut off this communication.

No record of a primary hemangioma of the malar bone has been published before the case reported by Schofield.[129] This tumor was 2 cm. in diameter, and the capsule was formed by unpenetrated periosteum.

Straith [130] reviews the chief characteristics of giant-cell tumors of the mandible. In the mandible, giant-cell tumors occur in those portions which are derived from cartilage. As the tumors are benign, treatment should be conservative. A case of

123. Cardwell, E. P.: Fracture of the Zygomatic Tripod, Plast. & Reconstruct. Surg. **4**:235 (May) 1949.

124. Graham, F. M.: The Management of Common Facial Injuries, Canad. M. A. J. **62**:259 (March) 1950.

125. Boman, K.: A New Operation for Luxation in the Temporomandibular Joint, Acta chir. scandinav. **9**:96, 1949.

126. Clay, R. C., and Blalock, A.: Congenital Arteriovenous Fistulas in the Mandible, Surg., Gynec. & Obst. **90**:543 (May) 1950.

127. Ivy, R. H.: Benign Hyperplasia of the Mandibular Condyle, Plast. & Reconstruct. Surg. **4**:445 (Sept.) 1949.

128. Gordon, S., and Macrae, H.: Monocular Blindness as a Complication of the Treatment of a Malar Fracture, Plast. & Reconstruct. Surg. **6**:228 (Sept.) 1950.

129. Schofield, A. L.: Primary Hemangioma of the Malar Bone, Brit. J. Plast. Surg. **3**:136 (July) 1950.

130. Straith, C. L.: A Mortised Mandibular Bone Graft Following Giant Cell Tumor Removal, Plast. & Reconstruct. Surg. **4**:282 (May) 1949.

adamantinoma of the mandible is presented by Castro-O'Connor and Bianchi.[131] This is an interesting case because every procedural step taken was done in one stage, including removal of the condyle and replacing it in contact with a bone graft.

Blocker and Stout [132] made an attempt to survey cases in which bone graft was applied to the lower jaw in service personnel during World War II. Ninety-one per cent of the grafts showed primary "take" and union. The authors conclude that equally good results were obtained in small defects when both rib and ilium were used as the source material. For the relief of extensive bone loss, they felt that large block grafts of pure cancellous bone from the ilium provided the most satisfactory repair material.

Ward and his associates [133] report a method of using an acrylic resin prosthesis in the raw area left by the resection of an adamantinoma of the mandible. It remained in place for six months, and after removal the floor of the mouth was soft and pliable. The result is excellent, and they feel that the bone grafting procedure now necessary is, of course, greatly simplified by having the fragments in normal position. In a subsequent article Ward, Edgerton, and Sikes [134] point out that the plan of reconstruction should be part of the original surgical procedure in a partial mandibular resection and that this program should be carried out with minimal delay.

Immediate reconstruction of the lower jaw at the time of the primary excision of large tumors is suggested by Marino, Turco, and Craviotto.[135] Their reconstruction is carried out by using cancellous bone chips, which are laid in the cavity where the facial bones formerly were, thus roughly imitating the general shape.

In a discussion of vitallium reconstruction of the malar bone, Kleitsch [136] describes disadvantages in the use of cartilage, dermal and bone implants not usually encountered by the well-trained surgeon. He reports one case illustrating these points. In an extremely interesting case of oxycephaly, Gilles [137] gives a description of an operation to reposition the recessed malar-maxillary component of the face. All suture lines were fractured and were held in place with intermaxillary wiring.

The surgical correction of mandibular prognathism has become a commonplace procedure. Waldron and his associates [138] use three different sites for correction of

131. Castro-O'Connor, R., and Bianchi, H. D.: Distant Results of an Immediate Bone Graft and Autogenous Condylar Graft in a Case of Adamantinoma of the Mandible, Brit. J. Plast. Surg. **3**:205 (Oct.) 1950.

132. Blocker, T. G., Jr., and Stout, R. A.: Mandibular Reconstruction, World War II, Plast. & Reconstruct. Surg. **4**:153 (March) 1949.

133. Ward, G. E.; Williamson, R. S., Jr., and Robben, J. O.: The Use of a Removable Acrylic Prosthesis to Retain Mandibular Fragments and Adjacent Soft Tissues in Normal Position After Surgical Resection, Plast. & Reconstruct. Surg. **4**:537 (Nov.) 1949.

134. Edgerton, M. T., Jr.; Ward, G. E., and Sikes, T. E., Jr.: Fixation and Plastic Repair After Partial Mandibular Resection, Plast. & Reconstruct. Surg. **5**:251 (March) 1950.

135. Marino, H.; Turco, N., and Craviotto, M.: Immediate Reconstruction of the Lower Jaw Following Surgical Excision of Large Tumors, Plast. & Reconstruct. Surg. **4**:36 (Jan.) 1949.

136. Kleitsch, W. P.: Vitallium Reconstruction of the Malar Bone, Arch. Surg. **60**:503 (March) 1950.

137. Gillies, H.: Operative Correction by Osteotomy of Recessed Malar Maxillary Compound in a Case of Oxycephaly, Brit. J. Plast. Surg. **3**:123 (July) 1950.

138. Waldron, W. C.; Karleen, C. I., and Waldron, C. A.: Fundamentals in the Surgical Treatment of Mandibular Prognathism, Plast. & Reconstruct. Surg. **4**:163 (March) 1949.

prognathism, depending on the degree of malocclusion which exists. The excess bone may be removed in the cuspid region or the retromolar region, or an osteotomy of the ascending ramus may be employed. They believe that preservation of the mandibular nerve is not essential.

Barrett Brown and associates [139] express preference for the use of the Gigli saw for ramisection of the jaw and continue to prefer the external approach.

The problem of macroglossia when associated with prognathism is considered by Edgerton.[140] The Dingham method for reducing the enlarged tongue is used in the first stage. For mandibular retrusion the author divides the mandible and applies traction for three weeks, which permits elongation of the soft tissue up to 5 cm. A bone graft is then placed in this defect.[141]

Beverly Douglas [142] follows up his very excellent article, written in 1946, on the treatment of micrognathia with obstruction. He includes cases from other medical centers and emphasizes the lifesaving value of his procedure.

A case of a patient with limited movement of the mandible following trauma is described by Potter.[143] A mass near the temporomandibular joint was chiseled away, with resulting good function.

An interesting case of a congenital defect of the scalp was studied by Kahn and Olmedo.[144] They closed this particular defect with normal skin as soon as possible. In the follow-up examination 10 months later the results were found to be good.

BENIGN LESIONS

For surgical removal of benign tumors in the parotid region, Brown and his colleagues [145] employ an approach that gives wide uncovering. They use a large facial flap that follows natural lines from the hair line, in front of the ear, around the lobe, and into the neck. The overlying gland is incised transversely, and the encapsulated tumor is dissected out, with preservation of the facial nerve. In a well-illustrated article, Trueblood [146] describes an operative approach, as in a radical parotidectomy, for parotid gland tumors which preserves the function of the seventh cranial nerve; he reports on 43 cases.

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139. Brown, J. B.; Fryer, M. P., and Templeton, J. B.: Recessive Ramisection of Jaw, Lip and Nose Correction, Corrective Dental Prosthesis in Cleft Lip and Palate Deformity, Plast. & Reconstruct. Surg. **6**:441 (Dec.) 1950.

140. Edgerton, M.: The Management of Macroglossia when Associated with Prognathism, Brit. J. Plast. Surg. **3**:117 (July) 1950.

141. Edgerton, M.: Plastic Surgery for Mandibular Retrusion, Plast. & Reconstruct. Surg. **6**:450 (Dec.) 1950.

142. Douglas, B.: A Further Report on the Treatment of Micrognathia with Obstruction by a Plastic Procedure, Plast. & Reconstruct. Surg. **5**:113 (Feb.) 1950.

143. Potter, J.: Limitation of Movement of the Mandible Following Trauma, Brit. J. Plast. Surg. **3**:115 (July) 1950.

144. Kahn, E. A., and Olmedo, L.: Congenital Defect of the Scalp, with a Note on the Closure of Large Scalp Defects in General, Plast. & Reconstruct. Surg. **6**:435 (Dec.) 1950.

145. Brown, J. B.; McDowell, F., and Fryer, M. P.: Direct Operative Removal of Benign Mixed Tumors of Anlage Origin in the Parotid Region, Surg., Gynec. & Obst. **90**:257 (March) 1950.

146. Trueblood, D. V.: Additional Experiences with Parotid Gland Tumors, West. J. Surg. **57**:463 (Oct.) 1949.

In two articles, Sparkman [147] discusses the primary repair of the severed parotid duct. A total of 12 cases, with three failures, are included. He has no artificial method for maintaining the patency of the duct and sutures the duct itself with 6 to 0 black nonabsorbable surgical suture. For the same condition Bornstein and Simon [148] use a stainless steel wire for a dowel. They speculate on the three failures in Sparkman's series of cases and wonder if they would not have been prevented had he used a dowel. Bailey and Shaff [149] also prefer to use a dowel to splint the severed duct in the repair of lacerations and fistulas of the parotid duct. In their series, repair was carried out in five patients from within a few hours to a few weeks. The authors pass a suture through both ends of the duct and leave it in place to serve as a dowel.

Hemangiomas have been divided into capillary types (which include compact hemangiomas), cavernous types, and cirsoid types by Reidy,[150] of England. Methods of treatment are discussed. He gives the following summary of the treatment of the large cavernous lesions: (1) The spongy type treated surgically involve gross risk of hemorrhage, and therefore cautious approach is required with sclerosing agent or irradiation, and (2) the infiltrating type should be excised as a primary procedure.

Ulloa [151] begins a layer of resection of a large cavernous hemangioma of the face by applying diathermocoagulation to the extent and depth of the whole tumor. When the edema has disappeared, the degenerated tissue is destroyed in layers through the extent of the tumor, leaving in place tissue structure of a size and thickness similar to normal.

Cole and Hunt [152] prefer treating deeper subcutaneous cavernous angiomas and cirsoid aneurysms by the injection of boiling water. They outline their method and state it is not new. Cirsoid aneurysms of the scalp are usually progressive in nature, as stated by Grimes and Freeman.[153] These lesions result from a nonpenetrating trauma to an area containing a preexisting vascular lesion of a congenital angiomatous nature. They are a form of arteriovenous aneurysm. Hunt and Cole advise complete extirpation.

In a well-presented article, thyroglossal cysts and sinuses are analyzed by Marshall and Becker.[154] They point out Sistrunk's contribution to the surgery of these lesions and stress the importance of removing the cyst tract up to the thyroid, the central portion of the hyoid bone, and that portion of the tract above the hyoid bone up to the foramen cecum at the base of the tongue.

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147. Sparkman, R. S.: Laceration of Parotid Duct: Further Experiences, Ann. Surg. **131**:743 (May) 1950; Primary Repair of the Severed Parotid Duct, ibid. **129**:652 (May) 1949.

148. Bornstein, L. A., and Simon, B. F.: Successful Primary Repair of Severed Parotid Duct, Plast. & Reconstruct. Surg. **6**:217 (Sept.) 1950.

149. Bailey, H. A., and Shaff, V.: Surgical Repair of Lacerations and Fistulas of the Parotid Duct, Ann. Surg. **129**:103 (Jan.) 1949.

150. Reidy, J. P.: Haemangiomata, Brit. J. Plast. Surg. **2**:50 (April) 1949.

151. Ulloa, M. G.: Layer Resection of Cavernous Hemangioma of the Face Followed by Plastic Restoration, Plast. & Reconstruct. Surg. **6**:46 (July) 1950.

152. Cole, P. P., and Hunt, A. H.: The Treatment of Cavernous Hemangiomas and Cirsoid Aneurysms by the Injection of Boiling Water, Brit. J. Surg. **36**:346 (April) 1949.

153. Grimes, O. F., and Freeman, N. E.: Cirsoid Aneurysm of the Scalp: Report of a Case, Ann. Surg. **129**:123 (Jan.) 1949.

154. Marshall, S. F., and Becker, W. F.: Thyroglossal Cysts and Sinuses, Ann. Surg. **129**:642 (May) 1949.

Only 35 cases of turban tumor have been reported. It has been suggested that these tumors arise from sebaceous glands or basal cells of the epidermis. They behave like simple adenomas and grow slowly. Bodenham [155] reports a case in which the patient had a history of having had the tumor for 20 years. The lesion was massive, involving the scalp, forehead, right ear, and right side of the face and nose. There were also some lesions on the abdomen and genitals.

MALIGNANT GROWTHS

The monograph "Cancer of the Head and Neck" by Hayes Martin [156] was published by the American Cancer Society, Inc., in 1949. It is such an important contribution to this vast subject that it should be in every physician's library. The conclusions are based on the observations of a physician who has employed both irradiation therapy and surgery (alone or in combination) in the treatment of tumors of the region of the head and neck for a period of more than 25 years.

Ward and Hendrick [157] of Johns Hopkins Hospital and the University Hospital of Maryland find it advantageous to differentiate between the three different types of malignant epithelial tumors of the skin of the head and neck. They are (1) basal, (2) squamous, and (3) adenocystic. A high percentage of skin cancer is curable in the early stages if properly treated. The conclusions of the authors are substantiated by comparing two large series of cases. In the first series, in which the lesions were primarily treated, the results were excellent. In the second series, in which the lesions had become resistant owing to previous insufficient treatment, the results were poorer even when radical measures were used.

New [158] believes that patients with cancer of the face do not receive as efficient treatment as one might expect considering the site of the lesion and the ease with which a diagnosis can be made. The time of repair for postoperative defects should depend on the nature of the growth and on the previous treatment. He thinks that irradiation of these facial cancers, if used at all, should be a secondary procedure.

A report by FitzGibbon and Bodenham,[159] from the cancer department of the British Royal Hospital, concerns malignant disease of the face and scalp. The authors make a wide excision by knife, not by diathermy, and cover the defect immediately with a split or pedicle graft.

Weaver [160] has written a good general article on the diagnosis and treatment of tumors of the neck. Inflammatory and cystic tumors are included but not primary tumors of the larynx, pharynx, and esophagus. A clear analysis of 856 tumors of the neck treated surgically at the Lahey Clinic was made by Marshall and Becker.[161]

155. Bodenham, D. C.: A Case of Turban Tumor, Brit. J. Plast. Surg. **2**:67 (April) 1949.

156. Martin, H.: Cancer of the Head and Neck: A Monograph for the Physician, New York, American Cancer Society, Inc., 1949.

157. Ward, G. E., and Hendrick, J. W.: Malignant Epithelial Tumors of the Skin of Head and Neck, Am. J. Surg. **79**:6 (June) 1950.

158. New, G. B.: Cancer of the Face: Treatment and Plastic Repair, Plast. & Reconstruct. Surg. **4**:528 (Nov.) 1949.

159. FitzGibbon, G. M., and Bodenham, D. C.: Malignant Disease of the Face and Scalp: Excision and Repair, Brit. J. Plast. Surg. **2**:13 (April)1949.

160. Weaver, D. F.: The Diagnosis and Treatment of Tumors of the Neck, Ann. Otol. Rhin. & Laryng. **59**:224 (March) 1950.

161. Marshall, S. F., and Becker, W. F.: Tumors of the Neck, South. Surgeon **15**:300 (May) 1949.

The commoner lymph node and thyroid enlargements are not included. The writers state that primary carcinomas of the neck are rare and probably arise from branchial rests of the parathyroids.

For the treatment of malignant tumors of the inferior alveolus and mandible, Conley and Pack [162] have made a good classification of the types of neoplasms, with the techniques used. This paper should be read by all interested in the treatment of malignant tumors. The authors limit their discussion to primary lesions.

Concerning carcinoma of the skin and lips, Traenkle [163] determines in which cases x-ray treatment, electrosurgery, and surgical excisions are indicated. Surgical excision is routinely performed in all but the smallest recurrent epitheliomas for which irradiation had previously been employed. Surgical excision is the method of choice for most large legions of the lip and commissures. Ward and Hendrick [164] prefer surgery rather than irradiation for carcinoma of the lip. The study covers 259 consecutive cases.

Judd and Beahrs [165] reason that metastatic lesions from epithelioma of the lower lip develop by lymphatic emboli rather than by direct extension. In general, they give preference to prophylactic neck dissections.

After studying 534 cases of cancer of the lip, Burkell [166] reached the following conclusions: (1) The lesion can be cured by x-ray therapy in a high percentage of cases, provided treatment is instituted early; (2) x-ray therapy is not the treatment of choice for lymph nodes involved by metastasis, and (3) prophylactic block dissections are not indicated. According to Sharp and his associates,[167] the best esthetic result in the treatment of cancer of the lip is obtained by irradiation. The authors favor surface radium alone or in combination with interstitial needles. The absolute percentage of five-year cures was 84.2% of the patients treated. Penn [168] presents a case of carcinoma of the lower lip which was repaired after excision by the use of an Estlander flap. He feels that too many patients with simple tumors of the lip are treated by radium instead of surgery. Surgery, in his opinion, should be offered at the earliest possible moment.

Kraissl and Greenfield [169] describe a case in which the diagnosis was a squamous cell epithelioma of the lip when actually the patient had tertiary syphilis. Their method of surgical correction was standard.

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162. Conley, J. J., and Pack, G.: Surgical Treatment of Malignant Tumors of the Inferior Alveolus and Mandible, Arch. Otolaryng. **50**:513 (Nov.) 1949.

163. Traenkle, H. L.: Routine Management of Carcinoma of the Skin and Lips, New York J. Med. **49**:1659 (July) 1949.

164. Ward, G. E., and Hendrick, J. W.: Results of Treatment of Carcinoma of the Lip, Surgery **27**:321 (March) 1950.

165. Judd, E. S., Jr., and Beahrs, O. H.: Epithelioma of the Lower Lip, Arch. Surg. **59**:422 (Sept.) 1949.

166. Burkell, C. C.: Cancer of the Lip, Canad. M. A. J. **62**:28 (Jan.) 1950.

167. Sharp, G. S.; Williams, H. F., and Pugh, R. W., Jr.: Irradiation as the Preferred Treatment of Cancer of the Lip, J. A. M. A. **142**:608 (March 11) 1950.

168. Penn, J.: Notes on a Case of Lip Carcinoma, Plast. & Reconstruct. Surg. **4**:374 (July) 1949.

169. Kraissl, C. J., and Greenfield, W. J.: A Problem of Diagnosis and Treatment of a Lesion of the Lips, Plast. & Reconstruct. Surg. **6**:275 (Oct.) 1950.

In discussing the treatment of cancer of the gums, Sharp and Wood [170] state that, whenever possible, mandibular defects should be repaired by bone grafts to restore function.

Not many cases of mixed tumors of the intraoral mucous membrane and salivary glands have been reported. Hobaek [171] is of the opinion that if the lesion is operable and if surgery is combined with irradiation, the outlook is comparatively favorable. Metastasis is late, and the progress is low. In Ivy's view,[172] irradiation treatment of malignant growths of the mucous membrane of the mouth and adjacent structures is frequently followed by necrosis of the bone and healthy soft tissues. For this and other reasons, surgical restoration of the missing soft tissues and, if possible, of the bone is highly desirable. Ivy presents reports of a series of cases to illustrate each of several methods of providing lining and covering for whole-thickness cheek and jaw defects following irradiation necrosis.

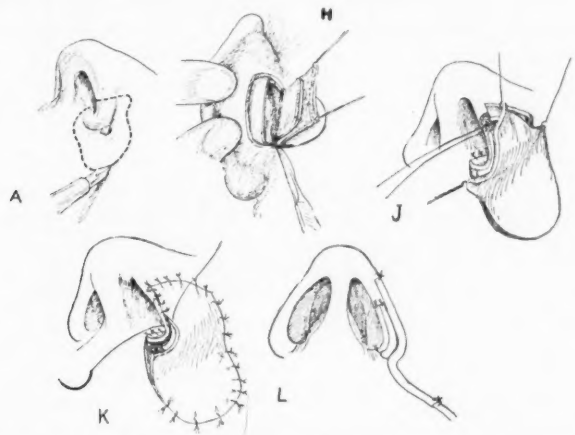

Fig. 13.—Converse's technique of composite graft for reconstruction of a nasolabial defect. *A*, area to be excised outlined in ink; *H*, graft being cut; *J*, inner layer of graft sutured in place; *K*, skin edge sutured to skin edge over cartilage; *L*, graft in place (Converse,[173] pp. 248-249).

Converse [173] shows good results in reconstructing the nasolabial area by a composite graft from the concha. This method permitted immediate replacement of tissue (Fig. 13).

Three cases in which massive carcinomas had been removed are presented by Catlin,[174] of the Head and Neck Service, Memorial Hospital, New York. The treatment was by the use of a tubed pedicle transplant.

170. Sharp, G. S., and Wood, R. C.: Treatment of Cancer of the Gums, J. Oral Surg. **8**:185 (July) 1950.

171. Hobaek, A.: Intraoral Mucous and Salivary Gland Mixed Tumors, Acta radiol. **32**:229 (Sept.) 1949.

172. Ivy, R. H.: The Repair of Full-Thickness Cheek Defects Following Irradiation Necrosis, Plast. & Reconstruct. Surg. **4**:188 (March) 1949.

173. Converse, J. M.: Reconstruction of the Nasolabial Area by Composite Graft from the Concha, Plast. & Reconstruct. Surg. **5**:247 (March) 1950.

174. Catlin, D.: Use of the Tubed Pedicle Transplant in Reconstruction of Surgical Defects in the Head and Neck, Plast. & Reconstruct. Surg. **6**:207 (Sept.) 1950.

IMPLANTS

In Digman's opinion,[175] an ideal substitute for bone has not been discovered. He prefers fresh autogenous bone and uses the ilium whenever possible. Converse and Smith[176] use chips and shaped pieces from the ilium to restore the contour of the maxilla following resection for carcinoma of the antrum.

Macomber[177] presents several cases of depressions of the forehead, nose, and chin which were corrected by the use of cancellous iliac bone chips. He thinks that the operation for the removal of the bone graft is not formidable and that there is less risk in this than in removal of costal cartilage. In addition to his other conclusions, those of exceptional interest are that the grafts survive when they are placed in vascular tissue, not necessarily in contact with bone, and that cancellous bone may disappear, be partially absorbed, or replaced by fibrous tissue when embedded in fat or placed in an area where the circulation is poor.

(*Comment.*—In our experimental work cancellous and cortical iliac bone grafts were completely absorbed when they were transplanted into the vascular soft tissues of the face and neck as well as into the avascular fatty tissue of the abdominal wall. When iliac bone grafts were transplanted and placed in contact with bone, the grafts retained their calcified structure. Septal bone grafts, by way of contrast, retained their calcified structure regardless of whether they were in contact with soft tissues or in contact with bone.)

The literature on transplantation of cancellous bone from the iliac crest, carefully reviewed by Bertelsen and Hasner,[178] shows the importance of red bone marrow for new bone formation. These authors report on 29 patients with a variety of conditions corrected by such transplants and express satisfaction with the result.

For obliteration of defects in the frontal bone, Lierle and Huffman[179] use autogenous cancellous bone from the ilium in minute bits. Sheehan and Swanker[180] employ cancellous bone that has been finely ground. These authors believe that in this form the bone "takes" more quickly because its soft consistency renders it more permeable to nutrient elements. Its "putty-like" character aids in a more accurate fit to contours and in immobilization of the graft.

Converse[181] lists 26 cases in which bone and cartilage were introduced by the oral vestibular route. He thinks that the results from these implants are just as successful as from those implants placed through external excisions. He found that clinically homografts and autografts behaved in a similar manner. There was no

175. Dingman, R. O.: The Use of Iliac Bone in the Repair of Facial and Cranial Defects, Plast. & Reconstruct. Surg. **6**:179 (Sept.) 1950.

176. Converse, J. M., and Smith, B.: Case of Reconstruction of the Maxilla Following Resection for Carcinoma of the Antrum, Plast. & Reconstruct. Surg. **5**:426 (May) 1950.

177. Macomber, D. W.: Cancellous Iliac Bone in Depressions of Forehead, Nose and Chin, Plast. & Reconstruct. Surg. **4**:157 (March) 1949.

178. Bertelsen, A., and Hasner, E.: On Transplantation of Cancellous Bone from the Iliac Crest, Acta orthop. scandinav. **19**:481, 1950.

179. Lierle, D. M., and Huffman, W. C.: A Simplified Method of Obliterating Frontal Bone Defects, Laryngoscope **59**:61 (Jan.) 1949.

180. Sheehan, J. E., and Swanker, W. A.: "Gelatinized" Bone for Repair of Skeletal Losses, Brit. J. Plast. Surg. **2**:268 (Jan.) 1950.

181. Converse, J. M.: Restoration of Facial Contour by Bone Grafts Introduced Through the Oral Cavity, Plast. & Reconstruct. Surg. **6**:295 (Oct.) 1950.

evidence that refrigeration interfered with the fate of transplanted bone.[182] In a very complete article, Lipscomb [183] agrees with Walsh that in refrigerating bone the temperature of choice is between —20 and —25 C. He finds refrigerated bone valuable in treating children. Weaver [184] of the University of Kansas believes that there is a tendency to use too massive pieces of homologous bone in comparison with the conservative pieces employed when autogenous bone is used. He thinks the results from employing cadaver bone are as good as those from the use of bone taken from the patient.

Brunner [185] reviews the contributions made by Peer regarding the fate of living and dead cartilage transplanted in humans and reports a case in which it was necessary to remove a living rib cartilage graft placed in a nose 21 years previously. On the evidence in his case the author maintains that cartilage covered with perichondrium is more resistant than cartilage without it.

An account of 73 cases of rhinoplasty in which carved cancellous bone grafts had been used is given by Gerrie and his colleagues,[186] from Montreal. According to clinical observations, these grafts live and establish a cortex within six months. Cottle and Loring [187] also are of the opinion that cancellous bone grafts from the crest of the ilium are ideal for rhinoplastic surgery.

Dupertuis [188] corroborates his animal experiments of a few years ago. There is clinical evidence that young human autogenous cartilage grafts show measurable growth over a period of from four to six years.

(*Comment.*—Dupertuis demonstrated definite growth of young rabbit cartilage grafts following free transplantation. One of us [L. A. P.] reported evidence of a small increase in size of young human ear and of septal and rib cartilage grafts buried for 14 months. Recently three young rib cartilage grafts which had been buried in abdominal fat for six, six and a half, and seven years, respectively, were removed and measured. None of these grafts showed an increase in size. Peer is inclined to believe that his observations of a small increase in size of young human cartilage may have been erroneous in view of the complete absence of growth in young human cartilage grafts buried for seven years.)

Experimental work on the loss of weight and volume in human fat grafts (Fig. 14) is presented by Peer.[189] He found that (1) human isogenous fat grafts completely disappeared; (2) human autogenous fat grafts survive transplantation as fatty tissue and, on the average, lose about 45% of their weight and volume in one

182. Converse, J. M., and Campbell, R. M.: Experiences with a Bone Bank in Plastic Surgery, Plast. & Reconstruct. Surg. **5**:258 (March) 1950.

183. Lipscomb, P. R.: The Bone Bank, Surg., Gynec. & Obst. **89**:485 (Oct.) 1949.

184. Weaver, J. B.: Experiences in the Use of Homogenous (Bone Bank) Bone, J. Bone & Joint Surg. **31-A**:778 (Oct.) 1949.

185. Brunner, H.: Fate of Autogenous Rib Cartilage Transplanted into the Nose, Plast. & Reconstruct. Surg. **4**:439 (Sept.) 1949.

186. Gerrie, J.; Cloutier, G. E., and Woolhouse, F. M.: Carved Cancellous Bone Grafts in Rhinoplasty, Plast. & Reconstruct. Surg. **6**:196 (Sept.) 1950.

187. Cottle, M. H., and Loring, R. M.: Cancellous Bone Grafts in Nasal Repair, Ann. Otol. Rhin. & Laryng. **58**:135 (March) 1949.

188. Dupertuis, S. M.: Growth of Young Human Autogenous Cartilage Grafts, Plast. & Reconstruct. Surg. **5**:486 (June) 1950.

189. Peer, L. A.: Loss of Weight and Volume in Human Fat Grafts, Plast. & Reconstruct. Surg. **5**:217 (March) 1950.

year or more following transplantation, and (3) a composite graft made up of multiple small segments of autogenous fat loses a larger per cent of its weight and volume than does a single fat graft of equal size. Peer postulates the following theory: living human autogenous grafts tend to retain their specific structure, following free transplantation in unlike tissue, when the cells survive as living entities. When the cells fail to survive, the graft is replaced by fibrous tissue or mixed connective tissue derivatives. He believes that the blood vessels in free grafts survive and an early circulation is established through direct anastomoses of host and graft blood vessels.

Fig. 14.—Patient who had two full-thickness skin grafts from eyelid with capillary nevi transplanted to recipient sites behind the ears. It can be noted that the capillary plexus in the skin graft survived transplantation and still serves as the vascular system of the graft one and one-half years after transplantation (Peer,[189] p. 226).

Malbec [190] has successfully used acrylic resin inclusions in 36 operations mostly around the face, over a period of 11 years. To correct a severe facial deformity resulting from extensive bone destruction, Jeremiah [191] used prefabricated acrylic resin as an implant. The acrylic resin has remained fixed and undisturbed for the last three and a half years.

190. Malbec, E. F.: Experience with Acrylic Inclusions, Bol. y trab. Soc. argent. cirujanos **11**:615, 1950.

191. Jeremiah, B. S.: Prefabricated Acrylic in Reconstructive Surgery, Plast. & Reconstruct. Surg. **5**:252 (March) 1950.

The use of tantalum for cranioplasties by Mäkelä [192] in war wounds of the skull has yielded good results in 30 cases in which the injury had occurred over two years previously. Plates of tantalum 0.015 in. (0.38 mm.) thick were used to correct the defects.

Bovine cartilage is employed by Marino and Niklison [193] in their plastic surgery. They consider the autograft as the ideal form. However, once the tissue is dead and has been submitted to the action of the preserving media there is no difference between that of human and that of animal origin. Thus, the authors prefer living autogenous cartilage but use preserved bovine cartilage instead of preserved cadaver cartilage as a second choice.

SKIN GRAFTS

Conway, Stark, and Docktor [194] did a rather complete study on the development of adequate vascularity in tubed pedicles. Evidence indicated that when the degree of fluorescence of a tubed pedicle matched that of the adjacent normal tissue and when a saline dermal wheal resorbed as rapidly from the tube as from the adjacent normal skin, then the pedicle might be transplanted successfully.

The fluorescein test is compared by Hynes and Macgregor [195] with the atropine absorption test in estimating the blood flow in pedicle grafts. They prefer the atropine test for simplicity and for being more precise quantitatively. Hynes also wrote a practical article on the blood vessels in skin tubes and flaps, which should be read in full.[196] The part concerned with the "blue" and "white" flaps and what to do about them is particularly well done.

In the opinion of Braithwaite,[197] the dermal and subdermal plexuses seem to be the most prominent features of the vascular system of a tube pedicle. Venous inadequacy appears to be the primary mechanism involved in the cyanosis. The author says that a thin pedicle is just as viable as one containing all the subcutaneous fatty tissue.

Hutchison, Tough, and Wyburn [198] state that under optimum conditions skin grafts tend to assume the sensory pattern of the skin of the region to which they have been grafted. It usually takes as long as 18 months to 2 years for the final sensory pattern to return.

Biopsies are illustrated by Flatt [199] to show that skin refrigerated for 50 days produces a satisfactory graft. The longer the storage time, the greater is the thickness of the keratin and epithelial layers.

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192. Mäkelä, T.: Tantalum Cranioplasty of War Wounds of the Skull, Ann. chir. et gynaec. Fenniae **38**:13, 1949.

193. Marino, H., and Niklison, J.: Bovine Cartilage in Plastic Surgery: An Experimental Study, Prensa méd. argent. **36**:216, 1949.

194. Conway, H.; Stark, R. B., and Docktor, J. P.: Vascularization of Tubed Pedicles, Plast. & Reconstruct. Surg. **4**:133 (March) 1949.

195. Hynes, W., and Macgregor, A. G.: The Use of Fluorescein in Estimating the Blood Flow in Pedicled Skin Flaps and Tubes, Brit. J. Plast. Surg. **2**:4 (April) 1949.

196. Hynes, W.: The Blood Vessels in Skin Tubes and Flaps, Brit. J. Plast. Surg. **3**:165 (Oct.) 1950.

197. Braithwaite, F.: Preliminary Observations on the Vascular Channels in Tube Pedicles, Brit. J. Plast. Surg. **3**:40 (April) 1950.

198. Hutchison, J.; Tough, J. S., and Wyburn, G. M.: Regeneration of Sensation in Grafted Skin, Brit. J. Plast. Surg. **2**:82 (July) 1949.

199. Flatt, A. E.: Observations on the Growth of Refrigerated Skin Grafts, Brit. J. Plast. Surg. **3**:28 (April) 1950.

The view is held by Blanchart [200] that split grafts should be used for losses of the scalp. He condemns the use of pedicle tube flaps and presents a case in which eight grafts were employed.

McCash [201] has devised an ingenious head cage for the fixation of free skin grafts to the head. It is made of felt, an elastic plastic (elastoplast), and plaster of Paris. The cage is light and strong and can be sterilized and applied directly to the operative field.

An unusual report of a scalp avulsion is given by Straith and Beers.[202] They think that an attempt should be made to use the outer layer of the split graft as a method of immediate repair.

Sheehan and Swanker [203] describe in detail the technique for fixing grafts with autogenous plasma and a leucocyte extract.

A complete study of the problem of skin homografts has been made by Rogers.[204] He states that no vascular tissue has ever been homografted with permanent successful results and suggests that skin grouping will give the answer to this problem.

BURNS

One of the most important articles to appear on the subject of burns in recent years is by Brooks, Dragstedt, and others [205] of Chicago. It is a report on sludged blood following severe thermal burns, and the significance of this phenomenon is discussed on the basis of present knowledge. The sludging process must be vigorously investigated before one can determine a reasonable and adequate treatment. Another paper concerning this complex problem by Brown and Dziob [206] should be read by every physician handling burn cases. These authors present a complete method of giving fluids and estimating the percentage of the body burned.

In the experience of Braithwaite,[207] blood transfusions should be given early in treating burns, to combat the possible effects of shock. He suggests that fluid and protein intake be limited until diuresis has counteracted the urea retention.

Kyle and Wallace [208] consider the problem of fluid replacement in burned children. Their article contains a chart showing the amounts of fluids to be given, which is easy to follow. The authors advocate the "exposure method" of taking

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200. Blanchart, A.: Closure of Scalp by Split Thickness Skin Grafts, Plast. & Reconstruct. Surg. **4**:289 (May) 1949.

201. McCash, C. R.: Plaster of Paris Head Cages in the Fixation of Free Skin Grafts to the Head, Brit. J. Plast. Surg. **2**:138 (July) 1949.

202. Straith, C. L., and Beers, M. D.: Scalp Avulsions: Report of Early Homo- and Zoo-Grafting and Recent Split Scalp Grafting, Plast. & Reconstruct. Surg. **6**:319 (Oct.) 1950.

203. Sheehan, J. E., and Swanker, W. A.: The Plasma Fixation of Skin Grafts, Mississippi Valley M. J. **71**:151 (Sept.) 1949.

204. Rogers, B. O.: The Problem of Skin Homografts, Plast. & Reconstruct. Surg. **5**:269 (April) 1950.

205. Brooks, F.; Dragstedt, L. R.; Warner, L., and Knisely, M. H.: Sludged Blood Following Severe Thermal Burns, Arch. Surg. **61**:387 (Sept.) 1950.

206. Brown, R. K., and Dziob, J. M.: Primary Treatment of Extensive Burns, Am. J. Surg. **79**:288 (Feb.) 1950.

207. Braithwaite, F.: Plasma and Blood Transfusions in the Treatment of Burned Patients, Brit. J. Plast. Surg. **2**:95 (July) 1949.

208. Kyle, M. J., and Wallace, A. B.: Fluid Replacement in Burnt Children, Brit. J. Plast. Surg. **3**:194 (Oct.) 1950.

care of burns, which is a simple method. They claim that third degree burns are ready for débridement of the crusts and for immediate grafting in three weeks.[209]

(*Comment.*—In the hands of the average worker the pressure dressing method of caring for burned patients is probably the best. The patients are more comfortable, and contractures will probably be much less.)

Mason,[210] of Florida, advises cleaning up burned areas with wet dressings and grafting as soon as possible. In managing moribund burned patients, Eisenstodt [211] has used very thin grafts when the hemoglobin level is as low as 30%.

(*Comment.*—Why not give blood transfusions to elevate the hemoglobin level before skin grafting?)

He observed no difference in the percentage of "takes" or in the quality of the final graft when it was applied to exuberant granulations compared with the takes after the removal of granulations.

Denman [212] recommends an orthopedic table for working on burned patients. Marino [213] proposes that emergency rolls, including a layer of cotton wool or mechanic's waste, should be kept on hand for the quick handling of large burned areas.

A good general article on the late treatment of burns is presented by Marcks and Travaskis.[214] They point out that carcinomas are more frequently a late complication of burns than we are led to believe. Any burn contracture or scar tissue formation that is subject to trauma should be regarded as a potential malignant growth.

Sudock's osteoporosis has been reported as occurring after first and second degree burns. As stated by Owens,[215] osteoporosis is a frequent manifestation in burns with loss of skin. There are roentgenographic findings of irregular bone rarefaction and progressive decalcification. Therapy is directed to maintenance of the patient's metabolic balance, especially in reference to nitrogen, calcium, and phosphorus. Early skin coverage to permit voluntary motion is advocated.

Patton and Millar [216] point out that physicians should learn to recognize and treat accidental skin ulcerations from radioisotopes. They advise immediate excision and replacement.

Brown, McDowell, and Fryer [217] observe that lesions due to atomic radiation develop faster than accumulative x-ray burn owing to excessive exposure in a short space of time. The treatment and underlying pathology in atomic burns are probably the same as in x-ray burns.

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209. Kyle, M. J., and Wallace, A. B.: The Exposure Method of Treatment of Burns, Brit. J. Plast. Surg. **3**:144 (July) 1950. Wallace, A. B.: Treatment of Burns, ibid. **1**:232 (Jan.) 1949.

210. Mason, M. L.: Early Closure of Burned Areas, J. Florida M. A. **36**:149 (Sept.) 1949.

211. Eisenstodt, L. W.: Surgical Management of the Moribund Patient, Am. J. Surg. **77**:634 (May) 1949.

212. Denman, F. R.: A Simplified Method of Skin Grafting Extensive Burns, Surgery **27**:740 (May) 1950.

213. Marino, H.: A Quick Pressure Dressing for Large Burned Areas, Plast. & Reconstruct. Surg. **5**:88 (Jan.) 1950.

214. Marcks, K. M., and Travaskis, A. E.: The Late Treatment of Burns, Plast. & Reconstruct. Surg. **6**:119 (Aug.) 1950.

215. Owens, N.: Osteoporosis Following Burns, Brit. J. Plast. Surg. **1**:245 (Jan.) 1949.

216. Patton, H. S., and Millar, R. G.: Accidental Skin Ulcerations from Radioisotopes, J. A. M. A. **143**:554 (June 10) 1950.

217. Brown, J. B.; McDowell, F., and Fryer, M. P.: Radiation Burns, Including Vocational and Atomic Exposures: Treatment and Surgical Prevention of Chronic Lesions, Ann. Surg. **130**:593 (Oct.) 1949.

Abstracts from Current Literature

Ear

Treatment of Chronic Progressive Deafness and Tinnitus with Massive Doses of Vitamin A. H. W. Bau and L. Savitt, Eye, Ear, Nose & Throat Month. **30**:83 (Feb.) 1951.

A group of 24 patients with varying degrees of progressive deafness was observed and treated with parenteral injections of massive doses of vitamin A. Tinnitus was minimized or subsided in six of nine patients, 66.6% of the total number. Bau and Savitt claim hearing improvement varying from 5 to 20 db. or more in 16 of 24 patients, or 66.6%. Of these, however, it should be noted that seven, or 29% of the total, showed a gain of but 5 to 10 db. Thus only 37.5% showed a gain of over 10 db.

Jennes, Waterbury, Conn.

Treatment of External Otitis: A Simple and Effective Technic. I. L. Ochs, J. A. M. A. **142**:1361 (April 29) 1950.

Ochs uses hydrogen peroxide to clean away any debris or discharge from the ear canal, and after cleaning he inserts a snug cotton wick which is saturated with acetic acid. The patient is given a prescription for acetic acid and aluminum acetate and told to keep the wick saturated with this solution. After 48 hours the patient returns to the office, and the wick is removed. The keratinized layer of epidermis will be found to be coagulated, and it is readily rubbed away with a thin dry cotton applicator.

This procedure may have to be repeated, but if an underlying seborrhea remains, the patient is given a prescription for juniper tar (cade oil®), sulfur, and salicylic acid, 3% solution of each, in fungicidal ointment and instructed in its use. In all of these cases, Ochs uses boiled household vinegar, 5% strength. Usually the cotton tampon is moistened with equal parts of vinegar and dilute aluminum acetate solution, but on an old eczematized ear, the vinegar is used full strength.

Gordon, Philadelphia.

Prophylactic and Therapeutic Control of Vestibular Disturbances with Dimenhydrinate. L. N. Gay, J. A. M. A. **145**:712 (March 10) 1951.

Gay discusses some of the reports of the literature on the problem of labyrinthine disturbance and includes a table entitled "'Table of the Effectiveness of Dimenhydrinate for Relief of Vestibular Reactions After Labyrinth Fenestration," which was prepared by E. H. Campbell of the Graduate School of Medicine of the University of Pennsylvania.

Several reports of cases are outlined. Gay summarizes as follows: "During the past two years several investigations have thrown light on the action of dimenhydrinate (dramamine®). The research of Himwich indicates a central action. The investigations of Haley and Harris, and of Batterman point to local action on the blood vessels and on the labyrinth. The efficacy of dimenhydrinate in labyrinthine disturbance after fenestration has been demonstrated by Campbell. This report is a presentation of results obtained by the administration of dimenhydrinate (50 to 100 mg. every four hours) to patients with various types of dizziness of labyrinthine as well as of central origin. The benefits these patients derived from the drug show that dimenhydrinate should be given to all persons with disturbance of balance before recourse to section of the nerve by the neurosurgeon or to destruction of the labyrinth with alcohol injection or to electrocoagulation by the otologist."

Gordon, Philadelphia.

Vertigo Which Does not Resemble Ménière's or Pseudo-Ménière's Syndrome. J. S. Riesco Mac-Clure, Rev. otorrinolaring. **10**:69, 1950.

Vertigo can be classified as (1) of unknown vestibular origin, (2) due to migraine, (3) focal or toxic, (4) postural of unknown origin, (5) psychogenic, (6) allergic, (7) circulatory, and (8) unclassified. Riesco has made a study of 337 patients, 92 of whom fall into the Ménière's syn-

drome group, 35 into the pseudo-Ménière's syndrome group, and the remaining 210 into the above eight groups. He presents a detailed discussion of each of these groups with illustrative cases and attempts to establish a differential diagnosis and symptom complex for each. Having evaluated the entire group, he feels that the otologist encounters many forms of vertigo, but careful evaluation of the patient from the otological and neurological standpoints must include the aid of the internist and the allergist, who can help determine many etiological factors responsible for this syndrome.

PERSKY, Philadelphia.

Pharynx

LATERAL PHARYNGEAL DIVERTICULA AS A CAUSE OF DYSPHAGIA. JACOB BUCKSTEIN and STANLEY REICH, J. A. M. A. **144**:1154 (Dec. 2) 1950.

Two cases are reported by Buckstein and Reich of patients who had dysphagia. They briefly review the embryology and symptomatology. One patient had to swallow "real hard" and had greatest difficulty swallowing solid food; then he might be free of dysphagia for as long as one month. The other patient stated that during a period of 20 years pills "stuck in his throat." During the same length of time he frequently regurgitated undigested food, sometimes three days after ingestion.

Spot-film roentgenograms should be made of the barium-filled hypopharynx of any patient with dysphagia to rule out lateral pharyngeal diverticula.

GORDON, Philadelphia.

RELATION BETWEEN TONSILS AND ADENOID OPERATIONS AND CLEFT PALATE. H. G. BEATTY, J. A. M. A. **145**:379 (Feb. 10) 1951.

Beatty discusses his technique of tonsillectomy and adenoidectomy in a patient who has had a successful cleft palate operation. According to his procedure, the operation is preferably delayed until the child is 6 or 7 years old, when all the tonsils may be removed or a strip of tonsil and capsule at the mesial attachment of the palatopharyngeus muscle may be left. The uvula is partially removed, and the borders of the palatopharyngi muscles are carefully split as far ventrally as desired for union and usually a little farther, as overcorrection is a good procedure for compensation for contracture and some possible separation. The dorsal borders of the muscles are then united with fine horsehair sutures and knots tied on the nasopharyngeal surface. The anterior borders are closed with fine horsehair. As the closure approaches the lower or ventral extent, the muscle is cut through sufficiently in a transverse direction for the attainment of relaxation. Bleeding is controlled. Silver wires are introduced through the palatoglossi and newly closed palatopharyngi, which are to be united over lead plates as in the soft palate closure.

A rubber breathing tube is passed through one nostril down to the lower border of the closure, which makes for easier breathing. The tube is removed in 24 hours. Daily attention is necessary to see that the tension of the wires on the lead plates is correct. Satisfactory functional results have been obtained.

GORDON, Philadelphia.

A COMPARATIVE STUDY OF THE VALUE OF BISMUTH, SULFONAMIDES, AND PENICILLIN IN THE TREATMENT OF ACUTE ANGINAS. JOAO MARINHO, Rev. brasil. oto-rino-laring. **17**:129, 1949.

Marinho has been using bismuth for acute anginas. Since the advent of the sulfonamides and more recently, penicillin, he has had an opportunity to compare the results obtained by these three drugs. He feels that bismuth gives much more rapid symptomatic relief in follicular tonsillitis than penicillin and is definitely preferable to the sulfonamides. Bismuth frequently aborts many peritonsillar abscesses and shortens the convalescent period following tonsillectomy.

PERSKY, Philadelphia.

THE AGE FACTOR IN TONSILLECTOMY. PEDRO FALCAO, Rev. Brasil. oto-rino-laring. **18**:1, 1950.

Falcao considers age as of secondary importance in tonsillectomy. Clinical indications should be the index for the decision for surgical intervention. He has performed tonsillectomies on patients ranging from the age of 12 months to 75 years. While he believes that the ideal age is between 3 and 5 years, factors which would interfere with the normal development of the

child or factors which might lead to serious systemic conditions, such as acute rheumatic fever and other complications, influence his decision as to earlier surgical intervention. With careful technique and particularly intracapsular dissection, Falcao believes that very little trauma occurs and that tonsillectomy can be performed at any time and at any age. In the younger children he frequently uses antibiotics in the acute stages of tonsillitis until the child is 3 to 5 years of age. For those with chronic tonsillitis he uses a mixture of protein, bismuth, and calcium.

PERSKY, Philadelphia.

Larynx

CONGENITAL WEB OF THE LARYNX. PHOEBE HUDSON, A. M. A. Am. J. Dis. Child. **81**:545 (April) 1951.

Hudson reviewed the histories of some 4,000 patients admitted each year to the Babies Hospital, Columbia-Presbyterian Medical Center, in New York, between 1932 and 1949. She found only nine cases of laryngeal web.

A 6½-month-old Negro boy entered the hospital on April 27, 1949, with laryngeal stridor and the usual signs of obstruction of the lower airways. The family history was not significant. The child was full term and of normal weight. Direct laryngoscopy showed a congenital web in the "false cord area" extending from the anterior commissure almost to the vocal processes. Tracheotomy was performed three days later. He regurgitated and vomited after feedings, and some fragments of glass were found once in the tracheotomy tube. No explanation is given therefor. There was diarrhea, but no causative germs were found. Temperature "spikes," were controlled by penicillin. In spite of these measures, the patient died; postmortem examination was done about 30 days later. The epiglottis was found to be small and deformed. The glottis had two orifices; the larger anterior orifice measured 4 mm. anteroposteriorly by 6.5 mm. transversely and the posterior 2 to 3 mm. in anteroposterior diameter. The web was pink and firm. (Two illustrations show the anatomy.)

This developmental deformity is supposedly based on an anomaly of the fifth arch (Frazer) with deficient "dissolution" of the lateral masses which form the larynx. A more detailed explanation is found in the text. Nine references are cited from the literature with especial reference to the three cases of L. H. Clerf and the description of Schmiegelow (in 1901).

VOORHEES, New York.

TRACHEOBRONCHIAL ASPIRATION WITH A URETHRAL CATHETER. LEONARD CARDON, J. A. M. A. **142**:1039 (April 8) 1950.

Cardon stresses the value of tracheobronchial aspiration because of the wide variety of medical conditions that can produce asphyxia and the fact that this treatment can be carried out by introducing a urethral catheter through the nose. Ten cases are summarized. Indications and contraindications are pointed out. No evidence of laryngeal trauma has been encountered attributable to this procedure. The importance of the recognition of the presence of retained tracheobronchial secretions, the consideration of the likelihood of asphyxia, and the treatment of the underlying disease or concomitant complication must ever be kept in mind.

GORDON, Philadelphia.

FACTORS RESPONSIBLE FOR LARYNGEAL OBSTRUCTION IN INFANTS. P. H. HOLINGER and K. C. JOHNSTON, J. A. M. A. **143**:1229 (Aug. 5) 1950.

Holinger and Johnston outline in detail the many causes of laryngeal obstruction in infants and correlate them with the anatomical, physiological, and pathological factors responsible for the condition. They show sections from colored motion pictures of the infant larynx taken through the laryngoscope.

Anatomical factors responsible for laryngeal obstruction in infants include the small size of the larynx and the presence of loose areolar tissue both subglottically and supraglottically. The subglottic space is surrounded by a firm cartilaginous ring so that inflammatory or neoplastic tissue expansion can take place only at the expense of the airway. The excessive secretion of mucus stimulated by inflammation and the extravasation of fluid into the airway owing to

negative intrathoracic pressures associated with laryngeal obstruction are associated physiological-pathological processes in respiratory obstruction. The obstruction is increased by the formation of crusts from the dried secretions.

GORDON, Philadelphia.

A SAFE AND POSITIVE METHOD OF TRACHEOBRONCHIAL ASPIRATION IN THE NEWBORN. E. B. EMERSON JR., J. A. M. A. **144**:613 (Oct. 21) 1950.

Emerson reviews briefly the indications for tracheobronchial aspiration in newborn infants. He has developed an instrument and technique that could be used by obstetricians or anesthetists (in the absence of a trained endoscopist) either in the hospital or in the home.

The instrument is described as follows: A small, 10 cm. piece of 4 mm. brass tubing with an adapter at one end may be attached to any standard suction apparatus. The brass tubing may be either straight or bent enough to bring the operator's hand off center of the lumen of the laryngoscope, thus yielding better vision as the instrument is passed to the vocal cords. The opposite end of the tubing is then machined so as to give a gradual bevel on the inner surface of the tube. Into this beveled end of the brass tube is fitted an appropriate length of no. 11 French ureteral catheter with a cylindrical tip, multiple openings on the side and an oblique open end.

GORDON, Philadelphia.

BENIGN OBSTRUCTION OF THE LOWER ESOPHAGUS. N. A. WOMACK, E. S. BRINTNALL, and J. L. EHRENHAFT, J. A. M. A. **145**:283 (Feb. 3) 1951.

Womack, Brintnall and Ehrenhaft report their findings in 23 patients and discuss in detail the normal motion of the esophagus and a classification that they have found of value for surgical intervention. They have summarized their results and clinical observations and show several illustrations, some of which are roentgenograms and others diagrams.

They summarize by saying, "A classification of benign esophageal obstruction due to primary motor insufficiency is described based on physiological, roentgenologic and operative findings. The clinical findings in 23 patients recently observed are described. Where feasible, the 'U' type of esophagoplasty is recommended as this has given the best results. When resection is necessary, it is important to resect the acid-secreting portion of the stomach as well as the terminal esophagus in order to prevent postoperative marginal ulceration. The problem of regurgitation ulceration and excoriation of the esophageal epithelium following operation still remains a considerable one."

GORDON, Philadelphia.

TREATMENT OF TUBERCULOSIS OF THE LARYNX BY CHEMOTHERAPY. L. J. WALLNER, G. C. TURNER, M. R. LICHTENSTEIN, and H. C. SWEANY, J. A. M. A. **145**:1252 (April 21) 1951.

The results in 70 patients with laryngeal tuberculosis given streptomycin and/or paraaminosalicylic acid are reported. No local treatment was given to the larynx in any of these patients. Of the 39 having pain, all but two were relieved and of the 70 having hoarseness, improvement was noted in 64 and in 41 ranged from a marked to a complete return of the normal voice. The drugs have a marked beneficial action on tuberculosis of the larynx. The prognosis becomes that of the pulmonary condition alone, rather than the poorer one of pulmonary tuberculosis with laryngeal involvement.

GORDON, Philadelphia.

BENIGN ENDOBRONCHIAL TUMORS: A COLLECTIVE REVIEW. H. T. LANGSTON, Surg., Gynec. & Obst. **91**:521 (Dec.) 1950.

Langston has undertaken a review of the entire literature pertaining to benign endobronchial tumors and a critical evaluation of the histogenesis of these growths. He believes that the appraisal of the accumulated writings reveals considerable confusion and inaccuracy as to the histological composition and behavior pattern of these tumors. Now, as bronchoscopy becomes a routine procedure and the scope of thoracic surgery is extended, he feels that the time has arrived for a more accurate and complete classification of tumors in this group. A more detailed study of their pathogenesis should lead to better understanding of their true pattern of behavior.

FRIEDBERG, Chicago.

TUBERCULOUS TRACHEOBRONCHITIS. ALFONSO ALDAMA, An. Soc. mex. oto-rino-laring. y bronco-esofagologia **11**:3, 1950.

Aldama discusses the clinical aspect, anatomy, and pathology of tuberculous bronchitis. He feels that the disease is a definite clinical entity. It occurs more frequently than is commonly realized. The bronchoscope has been the most valuable diagnostic aid in determining its presence. The treatment of the condition is very favorably influenced both by topical and by parenteral use of streptomycin. Aldama believes that before instituting any form of collapse therapy it is extremely important to do a bronchoscopic examination, since certain pathological conditions of the bronchi contraindicate the use of collapse therapy.

PERSKY, Philadelphia.

Nose

CHOANAL POLYPI. R. WALDAPFEL, Eye, Ear, Nose & Throat Month. **30**:79 (Feb.) 1951.

Waldapfel utilizes the instrument and method described by Lange in 1887 for removal of choanal polypi: Under local anesthesia, Lange's hook, point downward, is guided along the floor of the nose into the nasopharynx touching the posterior end of the inferior turbinate and is led along the lateral nasal wall upward; then the hook is turned outward and gently pulled forward until it encounters resistance by the thin pedicle of the choanal polyp. The pedicle is hooked and severed by a slight jerk with the hook, whereupon the polyp drops into the patient's throat and is ejected by him from his mouth. A case of bilateral choanal polypi is presented demonstrating the simplicity of the procedure.

JENNES, Waterbury, Conn.

PLASTIC SURGERY OF THE NOSE AND CHIN. L. W. EISENSTODT, J. Internat. Coll. Surgeons **15**:62 (Jan.) 1951.

Eisenstodt outlines his method and views on the management of deformities of the outer nose and the nasal interior, hypertrophied and obstructive lower turbinates, and plastic operations of the chin. He prefers radical resection of one or both tips of the inferior turbinates when they are hypertrophied, as seen in cases of moderate or severe vasomotor rhinitis, and prefers to do a rhinoplasty and a submucous resection at the same time. He feels that small pledgets of petrolatum gauze inserted in the nostrils serve a better purpose and are more efficacious than bulky packing inserted into the nose. His experience proves that a pressure adhesive plaster dressing applied under a Stent mold diminishes postoperative ecchymosis and edema and enables the nose to assume its final form more rapidly.

GORDON, Philadelphia.

OSTEOCHONDROMA OF THE NASAL SEPTUM. MOYSES CUTIN, Rev. brasil. oto-rino-laring. **18**:22, 1950.

Cutin describes a case of osteochondroma of the nasal septum occurring in a 19-year-old girl. The osteochondroma was of an extremely progressive nature with slow growth, produced a complete obstruction of both nostrils with a destruction of the mesial wall of the left maxillary sinus, and caused a protrusion of the left frontonasal process of the lacrimal bone. It was completely extirpated, and the histological diagnosis was osteochondroma. There was no recurrence of the growth after three and one-half years.

PERSKY, Philadelphia.

Miscellaneous

ALLERGY AS A FACTOR IN CHILDHOOD SINOBRONCHITIS. W. C. PRICE and I. A. SOLOW, J. Allergy **22**:4 (Jan.) 1951.

Complete records of 62 allergic patients were available among 339 children hospitalized with symptoms of chronic respiratory disease. In this group of allergic children with chronic respiratory complaints, sinobronchial involvement was evident on roentgenologic examination in 63% of those showing positive skin tests but was present in only 28% having negative skin tests. Price and Solow were impressed by the relatively high incidence of pneumonitis in the allergic group, 73% having been admitted with such a diagnosis. Comparably, the incidence of pneumonia among the group of 339 patients was computed to be 14%.

Another finding of statistical interest was the number of tonsilloadenoidectomies which had been performed on children who were noted to have an allergic diathesis; the operation apparently afforded these children little relief of their respiratory complaints. The incidence of tonsilloadenoidectomies in 37 children with positive skin tests was 48%, while among the 25 children with negative skin tests it was 23%. Among pediatric patients admitted to the medical service, the operative incidence of tonsilloadenoidectomies was 13%. When there was present a familial factor of allergy together with positive skin reactions, a pattern of ready susceptibility to lower respiratory tract infection seemed evident. The examination of posterior pharyngeal secretions for eosinophil cells proved 84% accurate in clinical trial among 26 pediatric patients included in the present study.

FRIEDBERG, Chicago.

RECOVERY ROOMS CONTRIBUTE TO BETTER PATIENT CARE. ALTON OCHSNER, Alton Ochsner M. Found. **9**:2 (Dec.) 1950.

Dr. Ochsner, the distinguished surgeon, points out the value of specialized nursing care immediately after an operation, that nurses providing such care must be able to detect early evidence of respiratory embarrassment and to handle competently certain situations that may arise, and that the recovery room should have every type of resuscitative apparatus and be manned by nurses especially trained to care for a patient after an operation. Though the recovery room at the Ochsner Foundation Hospital in New Orleans may appear as an expensive luxury, it has already paid off dividends in saving lives.

NOTE: The purpose of this short abstract is to remind the readers that the specialty of otolaryngology merits a good recovery room and that each staff should insist upon such a one, for it too will pay off dividends in the saving of lives.

GORDON, Philadelphia.

EVALUATION OF DIZZINESS. D. D. DEWEESE, J. A. M. A. **142**:542 (Feb. 25) 1950.

DeWeese discusses in a practical manner the symptoms of dizziness. Proper history taking and interrogation and a complete examination of the ear, the acoustic apparatus, and the static labyrinth will point out the necessary facts that will enable proper evaluation in any given case. He gives the following summary: "1. Dizziness is one of the most common, and most confusing symptoms presented by the patient. A carefully taken history is important in the evaluation of this symptom. It is also important that whirling vertigo be distinguished from other sensations described as dizziness by the patient. 2. Systematized vertigo usually indicates disease of the statokinetic system. 3. Nonsystematized vertigo may arise from disease in any part of the body. 4. Disease of the proprioceptive, cardiovascular and central nervous systems commonly give rise to dizziness outside the statokinetic system. 5. The otolaryngologist should become increasingly more alert to general systemic diseases in which dizziness is one symptom."

GORDON, Philadelphia.

ANTIHISTAMINIC DRUGS FOR COLDS. R. J. HOAGLAND, E. N. DEITZ, P. W. MYERS, and H. C. COSAND, J. A. M. A. **143**:157 (May 13) 1950.

We are reminded of the variables there can be in treatment of colds with antihistaminic drugs that would influence many of the reports that have been published. Bearing these variables in mind, the authors conducted a survey on 190 patients and have come to the following conclusions: 1. The necessity of a carefully controlled clinical investigation of treatment of the common cold is again demonstrated; in this investigation 27% of the patients receiving inert materials reported recovery within 24 hours. 2. There was no significant difference between the proportion of cures reported by patients receiving antihistaminic drugs orally and those receiving placebos orally. 3. Patients receiving antihistaminic drugs within 24 hours after symptoms began were as likely to fall into the no-effect group as into the cured group. 4. The effect of tripelennamine (pyribenzamine®) hydrochloride administered by nebulizer was essentially the same as the effect of inert materials given orally and intranasally. 5. Although the use of antihistaminic drugs orally and intranasally may decrease the irritating nasal discharge characteristic of the early phase of the common cold, the brief and variable duration of this phase makes a positive conclusion regarding this point difficult.

GORDON, Philadelphia.

Special Reports

HEARING AIDS ACCEPTED BY THE COUNCIL ON PHYSICAL MEDICINE AND REHABILITATION OF THE AMERICAN MEDICAL ASSOCIATION

As of Oct. 1, 1951

Audicon Models 400 and 415

Mfr., National Earphone Co., Inc.
20-22 Shipman St.
Newark 2, N. J.

Audivox Model Super 67

Mfr., Audivox, Inc.—Successor to Western Electric Hearing Aid Division
259 W. 14th St.
New York 11

Aurex Model F

Aurex Model H

Mfr., Aurex Corporation
1117 N. Franklin St.
Chicago 10

Beltone Harmony Mono-Pac

Beltone Symphonette Model

Beltone Mono-Pac Model M

Mfr., Beltone Hearing Aid Company
1450 W. 19th St.
Chicago 8

Cleartone Model 500

Cleartone Regency Model

Mfr., American Sound Products, Inc.
1303 S. Michigan Ave.
Chicago 5

Dahlberg Model D-1

Mfr., The Dahlberg Company
2730 W. Lake St.
Minneapolis 16

Dysonic Model 1

Mfr., Dynamic Hearing Aids, Inc.
1042 Atlantic Ave.
Brooklyn 16

Electroear Model C

Mfr., American Earphone Co., Inc.
10 E. 43rd St.
New York 17

Gem Model V-35

Gem Model V-60

Mfr., The Gem Ear Phone Co., Inc.
50 W. 29th St.
New York 1

Maico Atomeer

Maico UE Atomeer

Maico Quiet Ear Models G and H

Maico Model J

Mfr., The Maico Company, Inc.
21 N. 3rd St.
Minneapolis 1

Mears (Crystal and Magnetic) Aurophone Model 200

1947-Mears Aurophone Model 98

Mfr., Mears Radio Hearing Device Corp.
1 W. 34th St.
New York 1

Micronic (Magnetic Receiver) Model 101

Micronic Model 303

Micronic Star Model

Mfr., Micronic Company
727 Atlantic Ave.
Boston 11

(See Silver Micronic)

Microtone Audiomatic T-3

Microtone Audiomatic T-5

Microtone Classic Model T-9

Microtone Model T-10

Microtone Model 45

Mfr., The Microtone Company
Ford Parkway on the Mississippi
St. Paul 1

National Cub Model (C)

National Standard Model (T)

National Star Model (S)

National Ultrathin Model 504

National Vanity Model 506
Mfr., National Hearing Aid Laboratories
815 S. Hill St.
Los Angeles 14

Otarion Model E-2

Otarion Model E-4

Otarion Models F-1, F-2, and F-3

Otarion Model G-1 (Whisperwate)
Mfr., Otarion, Inc.
159 N. Dearborn St.
Chicago 1

Paravox Model J (Tiny-Myte)

Paravox Model XT ('Xtra-Thin)

Paravox Model XTS ('Xtra-Thin)

Paravox Model Y (YM, YC, and YC-7) (Veri-Small)
Mfr., Paravox, Inc.
2056 E. 4th St.
Cleveland 15

Radioear Permo-Magnetic (Multipower)

Radioear Permo-Magnetic (Uniphone)

Radioear All-Magnetic Model 55

Radioear Model 62 Starlet

Radioear Model 72
Mfr., E. A. Myers & Sons
306-308 Beverly Rd.
Mt. Lebanon
Pittsburgh 16

Rochester Model R-1

Rochester Model R-2
Mfr., Rochester Acoustical Laboratories, Inc.
117 4th St., S. W.
Rochester, Minn.

Silver Micronic (Magnetic and Crystal) Models 202M and 202C
Mfr., Micronic Company
727 Atlantic Ave.
Boston 11
(See Micronic)

Silvertone Model 103BM
Mfr., National Hearing Aid Laboratories
815 S. Hill St.
Los Angeles 14
Distr., Sears, Roebuck & Company
925 S. Homan Ave.
Chicago 7

Silvertone Model 103BM
Mfr. National Hearing Aid Laboratories
815 S. Hill St.
Los Angeles 14
Distr., Sears, Roebuck & Company
925 S. Homan Ave.
Chicago 7

Silvertone Model J-92
Mfr., Sears, Roebuck & Company
925 S. Homan Ave.
Chicago 7

Silvertone Model M-35
Mfr., Micronic Company
727 Atlantic Ave.
Boston 11
Distr., Sears, Roebuck & Company
925 S. Homan Ave.
Chicago 7

Silvertone Model P-15
Mfr., W. E. Johnston Mfg. Co.
708 W. 40th St.
Minneapolis 8
Distr., Sears, Roebuck & Company
925 S. Homan Ave.
Chicago 7

Solo-Pak Model 99
Mfr., Solo-Pak Electronics Corp.
Linden St.
Reading, Mass.

Sonotone Model 700

Sonotone Model 900

Sonotone Models 910 and 920

Sonotone Model 925

Sonotone Model 940
Mfr., Sonotone Corporation
Elmsford, N. Y.

Super-Fonic Hearing Aid
Mfr., American Sound Products, Inc.
1303 S. Michigan Ave.
Chicago 5

Televox Model E
Mfr., Televox Mfg. Company
1307 Sansom St.
Philadelphia 7

Telex Model 22

Telex Model 97

Telex Model 99

Telex Model 200

Telex Model 300-B

Telex Model 400

Telex Model 1700

Mfr., Telex, Inc.
Telex Park
Minneapolis 1

Tonamic Model 50

Mfr., Tonamic, Inc.
12 Russell St.
Everett 49, Mass.

Tonemaster Model Royal

Mfr., Tonemaster, Inc.
400 S. Washington St.
Peoria 2, Ill.

Trimm Vacuum Tube Model 300

Mfr., Trimm, Inc.
400 Lake St.
(P. O. Box 489)
Libertyville, Ill.

Unex Model A

Unex Midget Model 95

Unex Midget Model 110

Mfr., Nichols & Clark
Hathorne, Mass.

Vacolite Model J

Mfr., Vacolite Company
3003 N. Henderson St.
Dallas 6, Texas

Western Electric Models 65 and 66

Mfr., Audivox, Inc.—Successor to Western Electric Hearing Aid Division
259 W. 14th St.
New York 11

Zenith Model 75

Zenith Miniature 75

Zenith Model Royal

Mfr., Zenith Radio Corporation
5801 W. Dickens Ave.
Chicago 39

(All the accepted hearing devices have vacuum tubes.)

Accepted hearing aids more than five years old have been omitted from this list for brevity.

TABLE HEARING AIDS

Aurex (Semi-Portable)

Mfr., Aurex Corporation
1117 N. Franklin St.
Chicago 10

Precision Table Hearing Aid

Mfr., Precision Hearing Aids
5157 W. Grand Ave.
Chicago 39

Sonotone Professional Table Set Model 50

Mfr., Sonotone Corporation
Elmsford, N. Y.

Book Reviews

American Annals of the Deaf. Volume 96, Number 1. Edited by Pourie V. Doctor, Gallaudet College, Washington, D. C., Pp. 275.

This complete compendium of information on facilities for the care of the deaf from sociological and educational viewpoints is most valuable to the otologist who has frequently to advise the deaf adult or the parents of the deaf child as to care of the patient.

The text covers the following items: medical school personnel in speech and hearing problems, hearing aids accepted by the Council of the American Medical Association, teacher training centers, speech and hearing clinics, state agencies, rehabilitation services, conservation of hearing programs, research departments in schools for the deaf, directory of organizations, publications and libraries, and tabular statements of American schools for the deaf.

The uninitiated otologist who has not been working in this field will be surprised at the enormous endeavors being exerted by trained laymen and professional educators of the deaf in handling the problems. A list of instructors of the deaf covers sixty-four pages of closely printed names. There are fifty-one residential schools with a school registration of 13,636 pupils.

Traité de technique opératoire oto-rhino-laryngologique. By Georges Portmann, M.D. Second Edition. Pp. 1012, with 531 illustrations. Masson & Cie, 120 Boulevard Saint-Germain, Paris, 6e, 1951.

The second edition of Portmann's compendium of nose, throat, and ear operations is still but an abridgment of all the surgical procedures in the field of otorhinolaryngology.

One would think that it would scarcely require one thousand pages to cover the subjects, but about half of the book is taken up by excellent illustrations. The text describing the operations is in every instance epitomized and abbreviated to an unsatisfactory extent, so that the student will scarcely use it as a full guide to the operations. However, pictures for each procedure and the array of instruments needed are shown, and the steps in the operations are carefully and consecutively followed. The recommended anesthesia is invariably reported, and indications and contraindications are carefully but briefly covered.

All in all, the reader is greatly satisfied with the comprehensive nature of the coverage, with the clarity of the text, and with the excellence of the illustrations; and to many of the experienced operators the brevity will be welcome.

The printing, the paper, and the general format of the book are exceptional, and the volume as a whole is an excellent example of good workmanship.

CORRECTION

In the article by Doctor O. J. Becker, titled "Problems of the Dislocated Septum in Rhinoplastic Surgery," which appeared in the June 1951 issue of the ARCHIVES, the illustrations on pages 629 and 630 were incorrectly placed. The illustration on page 630 should have appeared on the top of page 629 over the legend for Figure 5. The illustration on the top of page 629 should have appeared at the bottom of page 629 over the legend for Figure 6, and the illustration at the bottom of page 629 should have been on page 630 over the legend for Figure 7.

Directory of Otolaryngological Societies *

INTERNATIONAL

PAN AMERICAN ASSOCIATION OF OTO-RHINO-LARYNGOLOGY AND BRONCHO-ESOPHAGOLOGY

Meeting: Third Pan-American Congress of Oto-Rhino-Laryngology and Broncho-Esophagology
Place: Habana, Cuba. Time: January, 1952.
President: Dr. José Gros. Information may be secured from Dr. Chevalier L. Jackson, 3401 N. Broad St., Philadelphia 40.

SECOND LATIN AMERICAN CONGRESS OF OTORHINOLARYNGOLOGY AND BRONCHOESOPHAGOLOGY

President: Prof. A. de Paula Santos.
Secretaries: Dr. José de Rezende Barbosa, Dr. Plinio de Mattos Barretto, Hospital das Clinicas, São Paulo, Brazil.
Place: São Paulo, Brazil.

NATIONAL

AMERICAN MEDICAL ASSOCIATION, SCIENTIFIC ASSEMBLY, SECTION ON LARYNGOLOGY, OTOLOGY AND RHINOLOGY

Chairman: Dr. Carl H. McCaskey, 20 N. Meridian St., Indianapolis.
Secretary: Dr. Sam H. Sanders, 1089 Madison Ave., Memphis 3.
Place: Chicago. Time: June 11-13, 1952.

AMERICAN ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. Derrick Vail, 700 N. Michigan Avenue, Chicago 11.
Executive Secretary-Treasurer: Dr. William L. Benedict, 100-1st Ave. Bldg., Rochester, Minn.
Place: Palmer House, Chicago. Time: Oct. 14-20, 1951.

AMERICAN BOARD OF OTOLARYNGOLOGY

Secretary: Dr. Dean M. Lierle, University Hospitals, Iowa City.
Place: Palmer House, Chicago. Time: Oct. 9-12, 1951.
Place: Royal York Hotel, Toronto, Canada. Time: May 13-16, 1952.

AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION

President: Dr. Herman J. Moersch, Mayo Clinic, Rochester, Minn.
Secretary: Dr. Edwin N. Broyles, 1100 N. Charles St., Baltimore 1.

AMERICAN LARYNGOLOGICAL ASSOCIATION

President: Dr. H. Marshall Taylor, 111 W. Adams St., Jacksonville, Fla.
Secretary: Dr. Louis H. Clerf, 128 So. 10th St., Philadelphia 2.
Place: Royal York Hotel, Toronto, Canada. Time: May 23-24, 1952.

AMERICAN LARYNGOLOGICAL, RHINOLOGICAL AND OTOLOGICAL SOCIETY, INC.

President: Dr. C. Stewart Nash, 708 Medical Arts Bldg., Rochester, N. Y.
Secretary: Dr. C. Stewart Nash, 708 Medical Arts Bldg., Rochester 7, N. Y.
Place: Royal York Hotel, Toronto, Canada. Time: May 20-22, 1952.

SECTIONS:

Eastern.—Chairman: Dr. Francis W. Davison, Geisinger Memorial Hospital, Danville, Pa.
Place: Waldorf-Astoria, New York. Time: Jan. 11, 1952.
Southern.—Chairman: Dr. Lester A. Brown, 490 Peachtree St., Atlanta.
Place: Academy of Medicine, Atlanta. Time: Jan. 14, 1952.
Middle.—Chairman: Dr. Ralph J. McQuiston, 20 N. Meridian St., Indianapolis.
Place: Indianapolis Athletic Club, Indianapolis. Time: Jan. 28, 1952.
Western.—Chairman: Dr. Howard P. House, 1136 W. 6th St., Los Angeles.
Place: County Medical Building, Los Angeles. Time: Jan. 19-20, 1952.

AMERICAN OTOLOGICAL SOCIETY

President: Dr. Gordon D. Hoople, 1100 E. Genesee St., Syracuse, N. Y.
Secretary: Dr. John R. Lindsay, 950 E. 59th St., Chicago.
Place: Royal York Hotel, Toronto, Canada. Time: May 18-19, 1952.

AMERICAN OTORHINOLOGIC SOCIETY FOR THE ADVANCEMENT OF PLASTIC AND RECONSTRUCTIVE SURGERY, INC.

President: Dr. Norman N. Smith, 291 Whitney Ave., New Haven 11, Conn.
Secretary: Dr. Joseph G. Gilbert, 111 E. 61st St., New York 21.

AMERICAN SOCIETY OF OPHTHALMOLOGIC AND OTOLARYNGOLOGIC ALLERGY

President: Dr. William H. Evans, 24 Wick Ave., Youngstown 3, Ohio.
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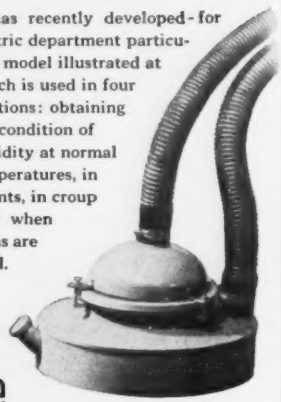

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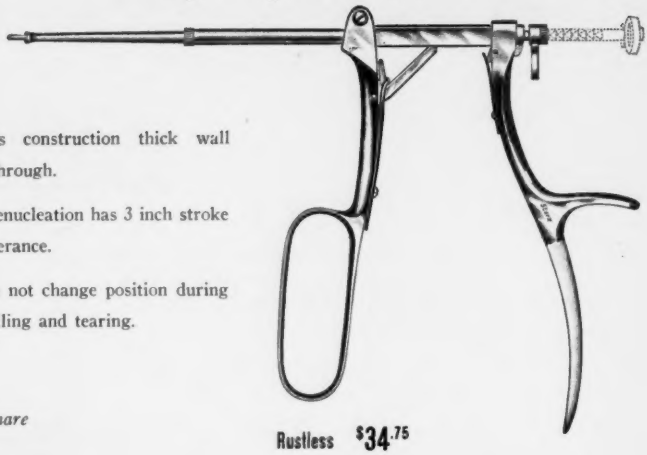

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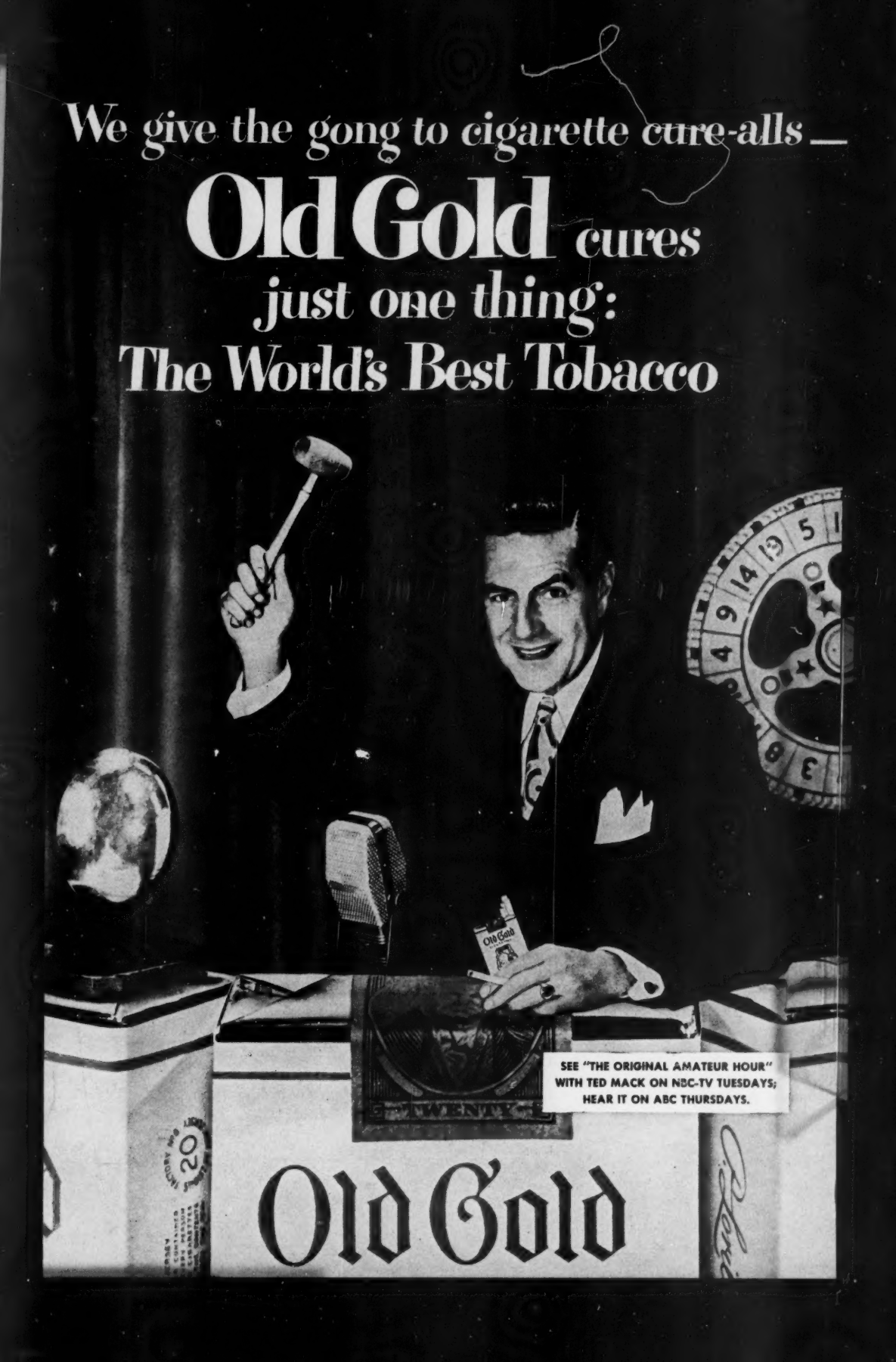
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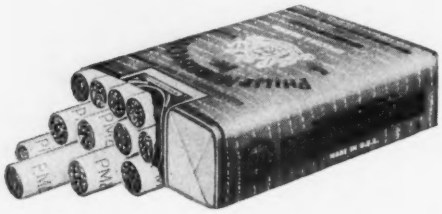

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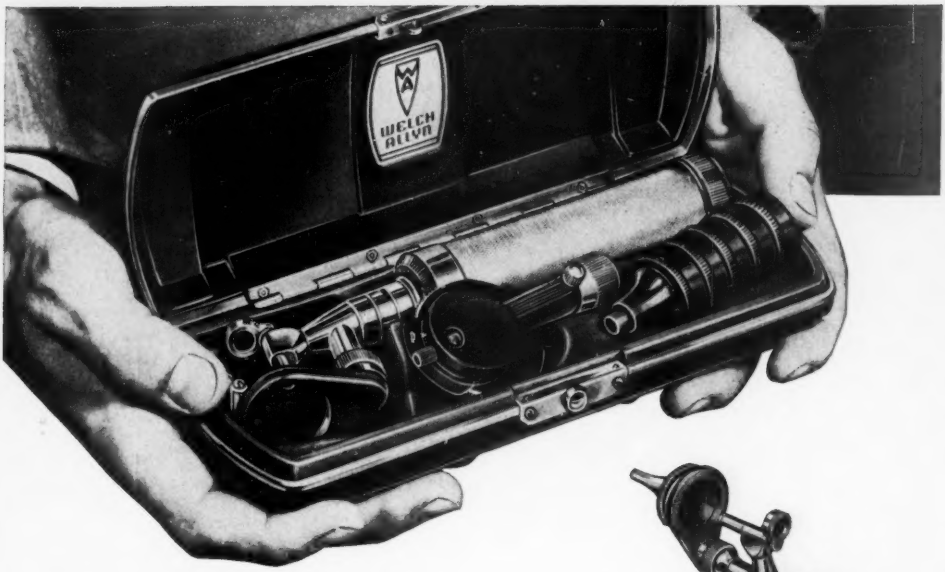

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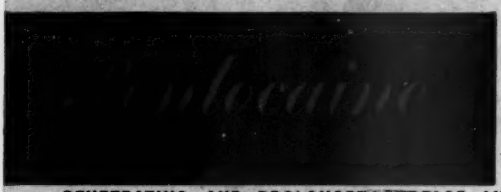

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1. Carabelli, A.: *Diseases of the Chest*, 15:532, May, 1949.

2. George P. Pilling & Sons, Company, 3451 Walnut Street, Philadelphia 4, Pa.

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